ΑΡΙΣΤΟΤΕΛΟΥΣ

ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ

ARISTOTLE

ON COMING-TO-BE & PASSING-AWAY

(DE GENERATIONE ET CORRUPTIONE)

A REVISED TEXT

WITH INTRODUCTION AND COMMENTARY

BY

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TO

THE MEMORY

OF

INGRAM BYWATER

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PREFACE

IN dedicating this book to the memory of the late Professor Ingram Bywater, I am trying to express, however inadequately, my sense of an overwhelming obligation. Bywater was the founder and first president of the Oxford Aristotelian Society, and when, about thirty years ago, it was my good fortune to be elected a member, the subject of our study was Aristotle's περὶ γενέσεως καὶ φθορᾶς. We discussed it line by line, every Monday evening during many successive terms, in our founder's rooms and under the inspiring guidance of his wonderful scholarship.

Beyond doubt I have incorporated in this edition many interpretations and suggestions which I owe either to Bywater himself or to my fellow-members of the Aristotelian Society, though I cannot now recall my borrowings in detail. But I am profoundly sensible of a far deeper and more general indebtedness. For Bywater's genius—his quiet but unmistakable mastery of the subject, his contempt for everything careless and unscholarly, his shrewd criticism and dry humour, his ready encouragement of every genuine endeavour—made of those weekly discussions an experience unique and unforgettable. The study of Aristotle (we could not but feel) demanded our utmost efforts: no labour could be spared, no detail neglected, no difficulty slurred. We were engaged upon an enterprise arduous indeed and infinitely laborious, but emphatically and supremely worth while. It was as if we were privileged to spend those Monday evenings in close and intimate communion with the very spirit of original work.

Amongst the many distinguished scholars who were at that time members of the Aristotelian Society, three have laid me under special obligations in connexion with this book—the late Mr. Charles Cannan, Professor John Burnet, and Professor John Alexander Smith. On its completion

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in 1915 my manuscript was entrusted to Mr. Cannan for submission to the Delegates of the Clarendon Press, and the lively personal interest he took in it was a source of constant encouragement to me in the long years of uncertainty that followed—when it was difficult to believe that anybody would ever care to publish a book on Aristotle or that I myself should ever be free to return to philosophy from propaganda. I owe to Mr. Cannan, in addition, a number of most valuable suggestions and criticisms—chiefly on my Introduction and Text—which he contributed a few months before his death. Frequent references in my Commentary bear witness to the help which, in common with all students of Greek philosophy, I have derived from the works of my friend, Professor Burnet. It is more difficult to define, even approximately, the extent of my debt to Professor J. A. Smith. Almost every week, during a friendship of nearly thirty years, we have discussed philosophy in general and Greek philosophy in particular. He was the originator, I believe, of most of our problems: I am certain that he contributed whatever of value emerged in our discussions. It is quite beyond my power to determine how much in this book is his, or mine, or the joint result of the efforts of us both.

When I returned to the study of Aristotle's *περὶ γενέσεως καὶ φθορᾶς* in the summer of 1910, my object was to prepare a translation for the series now being published by the Clarendon Press under the editorship of Mr. W. D. Ross. It was no part of my intention to write a commentary; and it would have seemed to me grotesque, had I been told that I should venture upon a revision of the text. But it soon became evident that a mere translation would be of little or no value, since the intrinsic philosophical interest of the original depends, to a large extent, upon what it implies and presupposes. In short, Aristotle's fascinating and masterly little treatise calls for a commentary in almost every sentence. It is full of allusions to the speculations of his predecessors and contemporaries, and inextricably

interwoven with the theories elaborated in his other works —particularly in the *Physics*, *de Caelo*, and *Meteorologica*, of which no modern English editions exist. It is, moreover, often difficult to interpret, and the obscurity (as I soon discovered) is due, in no small measure, to various defects in the traditional text.

Thus I was led on, step by step, first to write a detailed commentary and then to undertake the revision of the text. I collated photographs of six manuscripts, EFHJL and D^b, and took into consideration the commentary of Philoponos and also the Latin translation published by Andreas Asulanus in 1483 (see below, p. ix).[1] A few notes on these sources, and on the use I have made of them, may here be added.

(1) J = Vindobonensis, phil. Graec. 100.

This manuscript is described by Mr. F. H. Fobes in the *Classical Review*, Dec. 1913 ('A preliminary study of certain manuscripts of Aristotle's *Meteorology*'). According to Mr. T. W. Allen, it is earlier than E and belongs to the first half of the tenth century. There are a great many corrections, written above the line, most of which agree with L. I have noted (under the sign J^2) only those which differ from L. It has not proved possible to follow J in all passages, but I have treated it as, on the whole, equal in authority to E. In the following passages I have adopted J's

[1] I am greatly indebted to many friends for assistance in preparing the text. The late Professor Bywater gave me much valuable advice and presented me with his collation of a chapter (Book II, ch. 1) in a fifteenth-century manuscript in his possession; he also sent me notes on the readings in the first three chapters of Book II which he had inferred from the Latin translation in an old edition of the commentary of Aquinas. Mr. T. W. Allen (Fellow of Queen's College, and at that time University Reader in Greek) gave me his expert opinion on the dates of EFHJL and D^b. Mr. W. D. Ross, Fellow of Oriel, first drew my attention to J and also to Γ (see below, p. ix). Mr. J. L. Stocks (Fellow of St. John's College, Oxford) lent me his photograph and collation of J. Finally, I have to thank Dr. A. E. Cowley (Fellow of Magdalen and Bodley's Librarian), Mr. W. Ashburner (Honorary Fellow of Merton), Mr. A. B. Poynton (Fellow of University College), and Signor Ratti (Librarian of the *Biblioteca Ambrosiana*) for helping me to obtain photographs of some of the manuscripts in question.

reading *against* EFHL:—15^{b} 2,[1] 22^{b} 28, 23^{a} 30, 24^{a} 15 (J^{2}: cf. $\Phi^{c}\Gamma$), 28^{b} 28 (J^{1}: cf. D^{b}), 33^{b} 10 (cf. however EHLΦ^{c}), 36^{a} 12 (cf. however E^{2}H), 37^{a} 11. In 17^{a} 11 and 33^{b} 15 I have adopted conjectures based on J's reading. Further J has an interesting addition (which is reproduced in Γ and in the translation by Vatablus) at 22^{a} 29: and it adds a diagram in the text at 32^{b} 17. Finally, at 38^{b} 4, J reads *οὗτος* for *οὕτως*, thus confirming the conjecture of Bonitz (*οὗτος οὕτως*).

(2) E = Parisiensis Regius 1853.

This manuscript, which belongs to the tenth century, has been very much doctored, and the corrections are at least as late as the fifteenth century. (There would seem to be more than one corrector at work. I have marked the corrections with the sign E^{2}.) It is also somewhat carelessly written. Nevertheless it is of great importance. In the following passages I have followed it *against* FHJL:—16^{a} 12, 16^{b} 16, 22^{a} 29 (E^{1}: corr. E^{2}), 24^{a} 35, 25^{a} 27, 26^{a} 7, 26^{b} 16, 29^{a} 24, 32^{a} 31 32^{b} 25 (cf. F), 34^{a} 28, 35^{a} 15 (cf. J), 36^{a} 18, 37^{b} 20.

(3) F = Laurentianus 87. 7.

A twelfth-century manuscript, of considerable value. I have followed it *against* EHJL in 16^{b} 2, 25^{b} 5 (cf. Γ), 26^{a} 12 (cf. $\Phi^{c}\Gamma$), 27^{b} 30, 32^{b} 18, 35^{b} 24.

I have used the sign F^{2} in a few places where the corrections in this manuscript seemed worth quoting.

(4) H = Vaticanus 1027.

This is certainly a twelfth-century manuscript, if not of earlier date: it is probably older than F and is of considerable value. I have adopted its readings *against* EFJL at 22^{a} 10 (cf. Φ^{c}), 26^{a} 19 (cf. however FΓ), 27^{a} 20 (cf. however E^{2}FJ), 32^{b} 2 (cf. Φ^{c} Γ), 33^{b} 24.

(5) L = Vaticanus 253.

An inferior manuscript, of far less value than EFH or J, belonging to the fourteenth or fifteenth century. I have followed it *against* EFHJ in three passages: but in all of them its reading appears to be a mere conjecture of the

[1] In all references to the text I omit the first figure. Thus, e.g., 315^{b} 2 becomes 15^{b} 2.

scribe and not an original variant. The passages are $23^b 22$, $37^b 33$ (cf. Φ^c), $38^a 6$ (an obvious combination of the reading of H with that of FJ).

(6) D^b = Ambrosianus F. 113 sup.

This manuscript belongs to the fifteenth century and contains the commentary of Philoponos (cf. Vitelli's preface to his edition of Philoponos, p. vi). Bekker used it to some extent for his text of the *Metaphysics*. It is of very little value, and I have quoted it in five passages only ($15^a 27$, $22^a 19$, $28^a 4$, $28^b 28$, $34^b 7$), where its readings seemed of some interest.

(7) The commentary of Philoponos (*Ἰωάννου γραμματικοῦ Ἀλεξανδρέως σχολικαὶ ἀποσημειώσεις ἐκ τῶν συνουσιῶν Ἀμμωνίου τοῦ Ἑρμείου μετά τινων ἰδίων ἐπιστάσεων* κτλ.) is very valuable as an aid to the interpretation of Aristotle's treatise, and I have used it freely in my notes. Its value for the constitution of the text is perhaps not so great, but I have quoted those readings which might conceivably prove important. My references are to Vitelli's edition (Berlin, 1897). Φ^1 = readings in the lemmata. Φ^c = readings given in, or inferred from, the paraphrase. Φ = readings supported both by the lemmata and the paraphrase. Where the manuscripts of Philoponos differ, I have added the signs of those to which my quotation refers.

(8) Γ = readings (either in Latin or, by inference, in Greek) from the 'nova translatio' which Andreas Asulanus prints in his edition (3 vols., 1483) of Averroes' commentary on Aristotle. The treatise *περὶ γενέσεως καὶ φθορᾶς* ends with the following note:—'Nove translationi librorum de generatione et corruptione ab Averoi Cordubensi commentate: Summi philosophi Aristotelis ex Stragyra grecie oppido Nicomachi Medicine artis professoris filii: deo optimo maximoque favente finis impositus est: Impensa atque diligentia Andree de asula Venetiis impresse: Anno salutis christiane. MCCCCLXXXIII septimo calendas octobris'.

This translation, in spite of certain minor differences, is substantially the same as the old Graeco-Latin version to

which Jourdain refers—so far, at least, as I am able to judge from the specimen page given in his *Recherches sur les anciennes traductions latines d'Aristote* (new edition, Paris, 1843, Specimen XIII, pp. 412–13). I have quoted its readings only where they seemed of interest or of possible value.

Two other Latin translations which I have compared seem to be based on Jourdain's version. They differ from one another and from the translation I quote : but the differences are in the main superficial. The first is contained in an old copy (Paris, 1514) of the commentary of Paulus Venetus which the Librarian of Wadham College kindly placed at my disposal. The second was brought to my notice by the late Mr. E. W. Webster, Fellow of Wadham College. It is a fragmentary translation of Book I, which originally formed part of a translation of Aristotle's physical works printed at Venice and said to belong to the year 1482. The copy I examined consists of leaves taken from the bindings of old books and is preserved in the Library of Corpus Christi College, Oxford. I have also consulted the translation by Franciscus Vatablus (cf. $22^a 28$, 29, 30) which is printed in the Berlin Aristotle.

Bekker's text is based on EFHL, but his *apparatus criticus* is not very reliable. I have corrected—usually without remark—about two erroneous statements concerning the reading of each manuscript on every page of the Berlin edition. Many of these errors are doubtless unimportant, but some at least are serious. The Teubner text by C. Prantl (Leipzig, 1881) professes to follow the authority of E wherever possible. This promise, however, is not fulfilled: and I regret that I have been unable to form a high opinion of Prantl's work.

It remains for me to express my hearty thanks to the Delegates of the Clarendon Press for their generosity in publishing a book which is most unlikely to prove remunerative.

H. H. J.

ABBREVIATIONS, ETC.

In citing my own notes, I write (e.g.) 'cf. * 14ª 3–6' for 'cf. note on 314ª 3–6'.

Adamson = *The Development of Greek Philosophy* by Robert Adamson, edited by W. R. Sorley and R. P. Hardie (Edinburgh and London, William Blackwood & Sons, 1908).

Alexander, *ἀ. κ. λ.* = Alexander's *ἀπορίαι καὶ λύσεις* in *Alexandri Aphrodisiensis Scripta Minora* edited by Ivo Bruns (Berlin, 1892).

Apelt = *Beiträge zur Geschichte der griechischen Philosophie* by Otto Apelt (Leipzig, 1891).

Bäumker = *Das Problem der Materie in der griechischen Philosophie* by Clemens Bäumker (Münster, 1890).

Beare = *Greek Theories of Elementary Cognition from Alcmaeon to Aristotle* by John I. Beare (Oxford, Clarendon Press, 1906).

Bonitz = *Aristotelische Studien* by Hermann Bonitz (Vienna, 1862, 1863, and 1866).

Bonitz, *Ind.* = *Index Aristotelicus* by Hermann Bonitz (vol. v of the Berlin Aristotle).

Burnet = *Early Greek Philosophy* by John Burnet, third edition (London, A. & C. Black, Ltd., 1920).

Burnet, *Ethics* = the same author's edition of Aristotle's *Nicomachean Ethics* (Methuen & Co., 1900).

Burnet, *Greek Philosophy* = the same author's *Greek Philosophy, Part I, Thales to Plato* (London, Macmillan & Co., 1914).

Burnet, *Phaedo* = the same author's edition of Plato's *Phaedo* (Oxford, Clarendon Press, 1911).

Diels = *Die Fragmente der Vorsokratiker, &c.* by Hermann Diels, second edition (Berlin, 1906).

Diels, *Elementum* = the same author's *Elementum, eine Vorarbeit, &c.* (Leipzig, 1899).

Gilbert = *Die meteorologischen Theorien des griechischen Altertums* by Otto Gilbert (Leipzig, 1907).

Heath = *Aristarchus of Samos* by Sir Thomas Heath (Oxford, Clarendon Press, 1913).

Jaeger = *Studien zur Entstehungsgeschichte der Metaphysik des Aristoteles* by Dr. Werner Wilhelm Jaeger (Berlin, 1912).

Martin = *Études sur le Timée de Platon* by Th. Henri Martin (Paris, 1841).

Pacius = *Aristotelis De Coelo lib. IIII. De Ortu et Interitu II, &c.* by Iulius Pacius (Francofurti, Typis Wechelianis . . . MDCI).

Zabarella = *Iacobi Zabarellae Patavini Commentarii in magni Aristotelis libros Physicorum; Item: in libros de Generatione et Corruptione. Item: in Meteora . . . Anno MDCII Francofurti, Typis Wolffgangi Richteri, Sumptibus Ioannis Theobaldi Schönvvetteri.*[1]

Zeller[4] = *Die Philosophie der Griechen, &c.* by Dr. Eduard Zeller, fourth edition (Leipzig, 1889).

[1] My friend, Mr. R. P. Hardie, lent me his copy of this rare work. There is a copy, as I have recently discovered, in the Library at New College.

INTRODUCTION

Aristotle's conception of a 'science', and the place of the treatise περὶ γενέσεως καὶ φθορᾶς in his writings on natural philosophy.

§ 1. The intelligence, which, according to Aristotle, distinguishes man from the other living things, displays itself in all the spheres of his activity and characterizes his action and production as well as his speculation.[1] Thus man is an 'agent' (the responsible subject of praise and blame), and his behaviour is 'conduct' (morally good and bad), in so far as what he does is the effect of deliberate decision (*προαίρεσις*), i. e. issues from intelligent desire and not from unreflective impulse, appetite, or passion.[2] And he is a craftsman and an artist, a 'maker' of things useful and beautiful, in so far as he works under the guidance of clearly conceived ideals and with

[1] Cf. e. g. *Metaph.* 1025^{b} 25 *ὥστ' εἰ πᾶσα διάνοια ἢ πρακτικὴ ἢ ποιητικὴ ἢ θεωρητική* .... I use the term 'intelligence' in a wide sense, so as to include what Aristotle calls (in different connexions) *νοῦς, διάνοια, λογισμός, τὸ νοητικόν, τὸ λόγον ἔχον*, κτλ. I cannot here discuss the precise significance of these different terms, nor whether any of the psychical functions, which they denote, are attributed by Aristotle to animals other than man. It is enough for our present purpose to recognize that man, according to the broad outlines of Aristotle's doctrine, is distinguished from the two lower grades of *ἔμψυχα* (from the animals and plants), because the human *ψυχή* is essentially intelligent, thoughtful, reasoning. Man is *ζῷον λογικόν*: and his 'intelligence' permeates and characterizes all the activities of which the human soul is the originative source, even those which he seems to share with the other *ἔμψυχα*. Like the plants and animals, we assimilate food, grow, and reproduce our kind; and, like the animals, we feel, sensate, desire, and move. But *in us* these processes and activities are profoundly affected by the dominant character of the soul from which they issue—by its 'intelligence' (cf. e. g. *De Anima* B. 1–3).

[2] Cf. e. g. *Metaph.* 1025^{b} 22–25. On *προαίρεσις*, see especially *Eth. Nic.* Γ. 1–5.

a technique developed into skill by intelligent practice. His buildings, for instance, unlike the spider's web or the swallow's nest, result from the deliberate execution of a purpose. This purpose is not immersed in the blind striving of instinct. There is nothing latent or metaphorical about it, nor is it only our misnomer for the unthinking play of natural forces. It is the architect's ideal, the object of his explicit thought. It lies open to his reflective analysis and becomes the plan by which he consciously works.[1]

But the intelligence which is displayed in the activities of the craftsman and the artist, or of the statesman and the moral agent, is subordinated to an 'end' not its own. For the proper 'end' or work of intelligence is truth: and though the thought embodied in good action and production must be true, the object of the agent and the maker is not simply the attainment of truth. They wish to think truly in order that they may act or make well, and they pursue their investigation of the truth only so far as is required to make their conduct good, or their works useful or beautiful. The 'end' of the maker is the good product or work; and the 'end' of the agent is the good conduct itself, i. e. the particular piece of 'good living' in question.

It is only in his speculative activities that man pursues an 'end' which is the proper 'end' of intelligence. In the pursuit of knowledge simply for the sake of understanding—in what Aristotle calls *θεωρητικὴ ἐπιστήμη* or *φιλοσοφία*—the intelligence moves freely towards the attainment, and in the vision and enjoyment, of the truth.[2]

§ 2. Aristotle distinguishes, within the whole of speculation, three 'philosophies' or 'bodies of speculative knowledge'. The whole system of what we should call 'knowledge' or 'science' is thus articulated into 'first philosophy' or 'philosophy of God' (*θεολογική*), 'second philosophy' or 'philosophy of nature' (*φυσική*), and 'mathematical philosophy' (*μαθηματική*).[3]

[1] Cf. e. g. *Metaph.* 1032^{a} 32 ff., *Phys.* 199^{a} 17 ff.

[2] Cf. e. g. *Eth. Nic.* 1095^{a} 5, 1139^{a} 21–^{b} 4, 1179^{a} 35 ff.; *Metaph.* 980^{a} 21 ff., 993^{b} 20–23; *de Caelo* 306^{a} 16–17.

[3] Cf. e. g. *Metaph.* 1026^{a} 18 *ὥστε τρεῖς ἂν εἶεν φιλοσοφίαι θεωρητικαί,*

It is true that Aristotle speaks of *πρακτικὴ ἐπιστήμη* and *ποιητικὴ ἐπιστήμη*, and co-ordinates them with 'speculative knowledge' (*θεωρητικὴ ἐπιστήμη*): but it is clear that neither *πρακτικὴ* nor *ποιητικὴ ἐπιστήμη* is a 'science' in any sense in which we should naturally use that term. The first is not a theory of 'action', nor is the second a theory of 'production'. The man who embodies *πρακτικὴ ἐπιστήμη* is the *φρόνιμος*—the statesman or wise agent whose conduct is alive with his own intelligent insight. His *ἐπιστήμη* is *φρόνησις*, the thought which informs and spiritualizes emotion and impulse, passion and appetite. It is the thought at work *in* good conduct, the living reasonableness *in* 'action', not a reflective theory *about* 'action'. And the man who embodies *ποιητικὴ ἐπιστήμη* is the skilled craftsman or the artist, whose 'making' is alive with his own intelligent purpose. His *ἐπιστήμη* is *τέχνη*, a confirmed thoughtful mastery of his materials—a thought inseparably incarnated in the 'making' which it illumines and controls.

This is not the place to discuss Aristotle's conception of *πρακτικὴ* and *ποιητικὴ ἐπιστήμη*, nor to criticize his articulation of speculative philosophy. It will, however, be noticed that, *if we take his statements strictly*, neither aesthetics, nor moral philosophy, nor even logic, exists as a 'science' or purely speculative investigation. Aristotle's own *Poetics*, his *Ethics* and *Politics*, and his *Organon*—however paradoxical it may seem—are not, in his own view, results of the free movement of the intelligence in its endeavour to attain to truth. They are not, or at least they are not *primarily*, contributions to 'science'.

§ 3. 'First philosophy' or metaphysics[1] is the 'science

μαθηματική, *φυσική*, *θεολογική*. The treatise *περὶ γενέσεως καὶ φθορᾶς* belongs, as we shall see, to *φυσική*, i.e. it investigates a part of the subject-matter of the philosophy of nature.

[1] 'Metaphysics', though a post-Aristotelian term, is a convenient title for the science which Aristotle himself calls 'first philosophy' or 'theology'. Aristotle's writings on 'first philosophy' appear to have been collected after his death—either by Andronikos (as is commonly supposed) or by some earlier editor (cf. Jaeger, pp. 178–80)—under the title of *τὰ μετὰ τὰ φυσικά*, 'the problems subsequent to those of natural philosophy'.

which investigates *what is*, in so far as it *is*, and the properties which essentially attach thereto'.[1] The metaphysician, therefore, studies reality as a whole, and the various kinds and forms of the 'real', with a view to determine what is implied in the 'being' of anything which in any sense 'is', and to distinguish the kinds and degrees of reality possessed by the various departments and forms of the 'real'. He is thus led to distinguish between 'substantial' and 'adjectival' being: between that which 'is' in its own right and self-dependently, and that whose 'being' is inherence in something else or is in various senses derivative and dependent. Even within 'substantial being' there are degrees of reality. For there is substance which is through and through 'simple'; and there is substance which is 'composite', a union of different elements. The former is sheer actuality, without any unrealized basis of being, without any latent background, as it were, from which new activities may emerge or into which the present activities may subside. The latter is concrete of form and matter; it contains a duality of elements; it is in part actual and active, but in part always potential—a basis capable of emerging into activity, but as yet unrealized.

The substance which is sheer actuality is alone *absolutely* real. It is the primary 'real', the standard and measure of reality. All other things, which in any sense 'are', derive their 'being' in the end from it; they are ranked, in respect to their degree and kind of reality, according to their dependence upon, and their approximation to, this primary 'real'.[2]

§ 4. Hence it is the metaphysician who has e. g. to discuss the Laws of Contradiction and Excluded Middle.[3] He has to establish their unquestionable validity, by showing that they are presupposed in all knowledge and in all 'being'. They are in fact the most fundamental laws of 'being'. They define in the most general terms 'what is, in so far as it *is*', expressing the conditions to which anything whatever must

[1] Cf. e. g. *Metaph.* 1003ª 21 ff.

[2] Cf. e. g. below, * 36ª 14–18 with the passages there cited.

[3] Cf. e. g. *Metaph.* 1005ª 19 ff.

conform, if it is to 'be' in any sense and at all, and thus delimiting 'what is' from 'what is not'. For if anything, *A*, is to 'be', at least it cannot also be *not-A*; and at least it must accept as its predicate either *x* or *not-x*.

Again, it is the metaphysician who examines and develops the conception of the primary 'real', the absolutely substantial or self-subsistent. This, as he shows, is a substance which is through and through actual—a substance which *is* actuality or life, not a substance which has life or manifests activity. In it there is no distinction between 'nature' and 'expression'; its nature is single and is wholly actual or self-fulfilling. It *is* timeless or eternal life, a life which is activity without change and rest without stagnation.[1] And this eternal life Aristotle identifies with God. For God is mind, and mind which is wholly and singly expressed in self-contained and self-determining spiritual activity, in thinking turned upon itself, or thinking with thinking for its object.[2] God—the eternal life of mind, the pure spiritual actuality in which mind is self-expressed—is thus the primary 'real', and the central object of the metaphysician's speculation.

And metaphysics, since it is concentrated on the *primary* 'real', is itself the *first* of speculative sciences;[3] and since that 'real' is God, metaphysics is the 'philosophy of God' or 'theology'. God is for the metaphysician the absolutely 'real', and the standard and clue by which he explains the reality of everything else. And in his investigation of the less perfect and more derivative forms of being, he is completing his knowledge of God. For the eternal life, which God is,

[1] Cf. e. g. *Eth. Nic.* 1154^{b} 24–28.

[2] Cf. e. g. *Metaph.* 1074^{b} 33 *αὐτὸν ἄρα νοεῖ, εἴπερ ἐστὶ τὸ κράτιστον, καὶ ἔστιν ἡ νόησις νοήσεως νόησις.* It is clear from Aristotle's statements (e. g. in the *Metaph.* Λ. 6, 7, and 9) that he conceives God as 'subject' rather than as 'substance', if I may use Hegel's distinction. He speaks of God as *οὐσία*, but an *οὐσία* which *is ἐνέργεια ἄνευ δυνάμεως* or *εἶδος ἄνευ ὕλης*. God is 'substance' *qua* self-subsistent and self-determining.

[3] It is *πρώτη φιλοσοφία* on the principle that the rank of a science depends upon the rank—the degree of reality—of its subject-matter. Cf. e. g. *Metaph.* 1026^{a} 18–32.

radiates through the whole of 'being', communicating itself (immediately or mediately, and in intenser or weaker degrees) to all that *is*. Or, God is the ἀρχή, from which originates, and on which depends, the entire universe in all its parts; and the Ideal which inspires and animates all things.[1]

Hence, finally, the metaphysician traces out the divinity in things, i. e. exhibits the degree and kind of reality which belongs to the various departments of 'being'. It is, therefore, a part of his task to determine in what precise sense the 'composite substances'—the perceptible bodies, animate and inanimate, which constitute the world of 'nature'—are real;[2] and, again, to show what kind of 'being' is to be attributed to the mathematical things, e. g. to the solids and plane figures of the geometer, and to the numbers of the arithmetician.[3] Thus the metaphysician discusses and explains what the natural philosopher and the mathematician take for granted,[4] viz. the 'being' or reality of their subject-matters.

§ 5. Whereas metaphysics investigates reality as a whole, or 'what is, simply in respect to its being', natural and mathematical philosophy select, each of them, a determinate 'part' or 'kind' of the real.[5] The φυσικός selects perceptible and changeable substance, and studies it in respect to the movement, or to the other forms of change, to which it is liable. And the μαθηματικός studies the perceptible substances neither *qua* real, nor *qua* changeable, but only *qua quanta* (discrete and continuous), i. e. *qua* numerable and measurable.

Natural philosophy is thus doubly contrasted with metaphysics. For the φυσικός studies a part only of the real, and

[1] Cf. below, * 36ª 14–18, * 36ᵇ 30–32. Aristotle's God is a self-subsisting and self-fulfilling spiritual activity, 'apart from' or transcending the perceptible world: and yet God is *also* the divine life, pervading all the parts of 'being' as the perfect Order which gives to them their unity and intelligibility. Cf. e. g. *Metaph.* 1075ª 12–19. Plato's ἰδέα τοῦ ἀγαθοῦ is, in the same way, both transcendent and immanent: cf. *Republic* 508 e ff., and 526 d, e.

[2] Cf. e. g. *Metaph.* Z and H.

[3] Cf. e. g. *Metaph.* M and N.

[4] Cf. e. g. *Metaph.* 1025ᵇ 10–18, *Post. Anal.* 76ª 31 ff., and often.

[5] Cf. e. g. *Metaph.* 1003ª 22–26, 1025ᵇ 3–13.

investigates that part not *qua* real, but *qua* changeable. The metaphysician, on the other hand, investigates all forms of the real in respect to their reality. And natural philosophy is subordinate to metaphysics, being the 'second' of the speculative philosophies on the same principle on which metaphysics is the 'first'.[1] For the central object of the metaphysician's study is the primary 'real'—the timeless, imperceptible and changeless substance, which is 'simple' (*ἁπλῆ*), i. e. through and through one sheer actuality. But the part of the real which the *φυσικός* studies is 'composite substance' (*σύνθετος οὐσία*), i. e. a union of two elements, concrete of form and matter, and thus secondary and derivative in its being.[2]

Mathematics, alone of the speculative philosophies, has for its subject-matter not substance at all, but adjectival characters abstracted from the substance which they qualify.[3] The perceptible substances are *quanta*, i. e. quantified things. They have shape and size; they have unity, and multiplicity of parts. And certain further properties attach to the perceptible things in virtue of, or mediately through, their quantitative characters. These quantitative characters are thus the logical subjects of certain *πάθη*, which in fact inhere not in them, but (mediately through them) in the perceptible things. It is

[1] See above, p. xvii, note 3, and cf. e. g. *Metaph.* 1026^{a} 27 ff., 1037^{a} 13–17.

[2] The scope of the province of *φυσική* is explained below, § 10. The 'composite substance' which it studies is perceptible, and subject at least to movement, if not also to the other forms of change. Cf. e. g. *Metaph.* 1069^{a} 30 ff.

[3] In this sense, the mathematical sciences are said to be *περὶ εἴδη* (cf. e. g. *Post. Anal.* 79^{a} 7–10). Aristotle in one passage excepts astronomy. He says that 'it investigates perceptible (but eternal) substance, and is thus, of all the mathematical sciences, most akin to first philosophy' (*Metaph.* 1073^{b} 3–8). But this view of astronomy seems to be due to the fact that Aristotle substantiated (i. e. materialized) the spheres of Eudoxos and Kallippos, thus transforming an abstract mathematical system into a mechanical system of homocentric spherical shells (see below,* 36^{a} 14 – ^{b} 10, with the passage there quoted from Sir Thomas Heath's *Aristarchus of Samos*). Astronomy, as we shall see in § 6, like optics and acoustics, is both a mathematical science and a part of *φυσική*. Cf. also below, § 10.

these quantitative characters, these 'adjectivals', which the mathematician severs by definition from their substances. In his science they become the subjects, of which he demonstrates *πάθη*; i. e. they are treated as if they were substances, really subsistent things, the owners of the properties which they mediate. The mathematical things, therefore, of which the mathematician demonstrates certain properties, are mere adjectives abstracted from the perceptible substances. The solids, planes, lines, points, and units, whose 'being' the geometer and the arithmetician take for granted, are in fact so many specific determinations of the quantitative character of the perceptible things. Their 'being' is adjectival, not substantial.[1]

§ 6. Although Aristotle speaks of mathematics as a single 'speculative philosophy', he also speaks of 'the mathematical sciences',[2] and attributes to each of them a distinct 'kind', or sphere, of 'being' as its subject-matter. Geometry and arithmetic e. g. have reciprocally-exclusive *γένη ὑποκείμενα*. Continuous magnitude on the one hand, and number on the other, are self-contained wholes or 'kinds' of 'being', so that it is illegitimate to attempt to prove an arithmetical conclusion through a geometrical middle term, or *vice versa*. In every demonstration in the science of arithmetic, all three terms (major, minor, and middle) must belong to the sphere of number: and in every demonstration in the science of geometry, all three terms must belong to the sphere of continuous magnitude.[3]

Aristotle's conception of the unity of a science is puzzling and perhaps not altogether consistent. A science is one, when its subject-matter is a single 'kind'.[4] But what constitutes a single 'kind' is far from clear. Thus, although

[1] Cf. e. g. *Phys.* 193^{b} 22 ff., *Metaph.* K. 1061^{a} 28 – ^{b} 33, Λ. 1073^{b} 3–8, M. 1077^{b} 12—1078^{a} 31. The passages cited from K and M undoubtedly express Aristotle's doctrine, even if these books were not written by Aristotle himself.

[2] Cf. e. g. *Metaph.* 1003^{a} 25 (*αἱ μαθηματικαὶ τῶν ἐπιστημῶν*), 1026^{a} 25–27.

[3] Cf. *Post. Anal.* 75^{a} 38 – ^{b} 20.

[4] Cf. e. g. *Metaph.* 1003^{b} 19, *Post. Anal.* 87^{a} 38 – ^{b} 4.

quanta fall apart into at least two reciprocally-exclusive 'kinds' (into number, the system developed out of an indefinite plurality of 'units', and into spatial magnitude, the system developed out of 'points and lines'), nature is a single 'kind' of 'being'.[1] Hence *φυσική* is a single science, although it includes in its survey a great variety of perceptible substances, some of which are eternal, whilst others come-to-be and pass-away. Mathematical philosophy, on the other hand, is rather a series of connected sciences than a single science. There are 'parts' of *μαθηματική*, and it includes within itself a 'first' and a 'second' science, and others continuing the series.[2] The order of these successive mathematical sciences appears to be determined by the increasing complexity of the mathematical things whose 'being' is taken for granted. Arithmetic e.g. is prior to geometry in the series, because the arithmetician assumes the 'being' of the 'unit' (*οὐσία ἄθετος*) only, whereas the geometer assumes the 'being' of the 'point', i.e. unit *plus* position (*οὐσία θετός*).[3]

The mathematical sciences come into close connexion with certain provinces of *φυσική*. Thus e.g. acoustical, optical, and astronomical phenomena are investigated, in different ways, both by the philosophy of nature and by mathematics. The *φυσικός* establishes empirical generalizations as to what combinations of notes, or what musical intervals, produce consonances and dissonances. But the scientific explanation of these (and other) acoustical phenomena is arithmetical, derived from the theory of ratios. Again, the *φυσικός* observes the phenomena of light and establishes empirical generalizations with regard e.g. to the deflexion of the visible line (the ray) in various *media* and its reflection from various surfaces. But the scientific explanation is geometrical, a corollary of the abstract theory of lines and angles. Lastly, the *φυσικός* studies the 'heavenly bodies'. He observes the apparent sizes, shapes, and distances of the stars and planets, and formulates empirical generalizations with regard e.g. to eclipses, risings, and

[1] Cf. *Metaph.* 1005^{a} 34 (*ἓν γάρ τι γένος τοῦ ὄντος ἡ φύσις*), 1025^{b} 18–21.

[2] *Metaph.* 1004^{a} 6–9, and cf. 1026^{a} 23–27.

[3] Cf. *Post. Anal.* 87^{a} 31–37.

settings, and so forth. But here again the scientific explanation is mathematical, a corollary of the geometry of solids, and presumably also of an abstract theory of motion, i. e. of dynamics.[1]

§ 7. Each of these sciences—the mathematical sciences and the philosophy of nature—has a determinate 'part' or 'kind' of 'being' as its province. And the character of such a 'kind' determines the procedure of the science in its endeavour after truth. The procedure is what Aristotle calls 'demonstration' (*ἀπόδειξις, ἀποδεικτικὸς συλλογισμός*), and each of these sciences is a 'demonstrative science' (*ἀποδεικτικὴ ἐπιστήμη*).[2] The aim of a 'demonstrative science' is (we may say shortly) so to analyse and resynthesize its 'kind', that the mediated necessary judgements, which are the conclusions of the science, precisely reflect the mediated necessary connexions between substances and properties which are the inner articulation of the 'kind'. The 'truth' here to be attained is a *replica* of the 'real'.

Each 'kind' is a relatively self-contained whole, a world of 'substances'[3] with their essential properties. The substances, however, which are the inhabitants of this world, though individual, are nevertheless universal or typical. They are the *infimae species* (the *ἄτομα εἴδη*) of the 'kind' (the *γένος*) in question. 'Man' e. g. is an individual, or unique, species of 'animal', which itself is a specification of *σῶμα φυσικόν*, the 'kind' studied by *φυσική*. Similarly 'the circle' is an individual, or unique, type of plane figure.

[1] Cf. e. g. *Post. Anal.* 78^{b} 34—79^{a} 16, *Physics* 193^{b} 22—194^{a} 12. Unfortunately Aristotle's theory of the relation of astronomy, acoustics, and optics as parts of *φυσική* (the 'subalternate' sciences) to the mathematical sciences (the 'subalternant' sciences) is nowhere fully worked out. I have tried to interpret his slight indications correctly: but—particularly with regard to astronomy (cf. above, p. xix, note 3, and below, § 10)—the whole subject is very obscure.

[2] The doctrine of the *Post. Anal.* as to the aim, nature, and method of *ἀποδεικτικὴ ἐπιστήμη* undoubtedly applies to the mathematical sciences and to *φυσική*. It is doubtful whether—and, if so, under what qualifications—it applies to metaphysics.

[3] For the purposes of the *Post. Anal.*, the mathematical things, *qua* logical subjects, are treated as if they were substances: cf. above, § 5.

And both 'man' and 'the circle' are universal; a 'such-everywhere-and-always', not a 'this-here-and-now'.[1]

Each of these 'substances'—each *ἄτομον εἶδος*—can be analysed, though not divided. The analysis, that is to say, is into 'constitutive moments' of its individual being, not into separable parts. And these constitutive moments reduce to two—viz. 'the proximate generic nature', of which the substance is a specification, and 'the last *differentia*', i.e. the *differentia* which converts that generic nature into the substance, or species, in question.[2] The constitutive moments are 'essential' predicates[3] of the substance. For they are necessary to its being, elements in its essential nature (*τὰ ἐν τῷ τί ἐστι κατηγορούμενα*), and the formula which enumerates them is its definition. Thus the definition of 'man' (*ζῷον-δίπουν λογικόν*), or of 'the circle' (*ἐπίπεδον τὸ ἐκ τοῦ μέσου ἴσον*),[4] resynthesizes the individual substance out of its

[1] 'Sokrates' and 'Kallias', or 'this circle' and 'that circle', are distinguishable only for *αἴσθησις*, not for *ἐπιστήμη*. They do not differ in their knowable or definable being, in their 'form'. Hence their difference is irrelevant for science; it is an affair merely of the coincident and variable properties, or merely of 'the matter' in which 'the form' is embodied. For further explanations, and some qualification, of this doctrine, see below, § 8. Aristotle, it may be thought, comes perilously near to the theory which he imputes to Plato and condemns: for the *ἄτομον εἶδος* ('man-as-such', 'the circle', &c.) shows unmistakable affinity to the Platonic *ἰδέα* as Aristotle interprets the latter. Yet at times he is fully conscious of the difficulty: and perhaps the distinction between *ἐπιστήμη* as a *ἕξις*, and *ἐπιστήμη* in its fulfilment as *θεωρία*, is in part an attempt to meet it (cf. e.g. *Metaph.* Λ. 1071^{a} 24–29, M. 1087^{a} 10–25, *de Anima* 417^{a} 22–29).

[2] Any remoter *genus*, and any *differentia* specifying such remoter *genus*, may be stated in the 'set of terms' or *formula* (the *λόγος*) defining the substance. But in principle, and for ultimate analysis, the constitutive moments reduce to the proximate *genus* and the last *differentia* (*εἰδοποιὸς* or *τελευταία διαφορά*), the latter being related to the former as *ἐνέργεια* to *δύναμις*: cf. *Metaph.* 1037^{b} 8—1038^{a} 35.

[3] Cf. e.g. *Post. Anal.* 73^{a} 34–37 *καθ' αὑτὰ δ' ὅσα ὑπάρχει τε ἐν τῷ τί ἐστιν, οἷον τριγώνῳ γραμμὴ καὶ γραμμῇ στιγμή (ἡ γὰρ οὐσία αὐτῶν ἐκ τούτων ἐστί, καὶ ἐν τῷ λόγῳ τῷ λέγοντι τί ἐστιν ἐνυπάρχει) . . . .*

[4] This is given as the definition of 'circle' in *Rhet.* 1407^{b} 27: cf. also *Post. Anal.* 92^{b} 20.

proximate *genus* and its ultimate *differentia*, i. e. out of 'moments' resulting from its analysis.

Now every science takes for granted the being and the meaning of its 'kind', and of the 'substances' into which it is articulated, or which are its ἄτομα εἴδη. Plane geometry e. g. assumes that there is such a thing as plane figure, and that plane figure is so-and-so, or must be *thus* defined. It also assumes that the ἄτομα εἴδη of the γένος—viz. points and lines, and the more complex plane figures (triangle, square, circle) which develop out of them—*in some sense* 'are real', and mean so-and-so, i. e. must be *thus* defined. Natural philosophy similarly takes for granted the meaning and the being of φυσικὸν σῶμα as a γένος, and the meaning and being of the subordinate *genera* and of the 'substances' or ἄτομα εἴδη into which it is articulated. This assumption of the 'being' of the kind and of its articulations is the ὑπόθεσις of the science.[1] And either the 'kind' itself, or its subordinate *genera*, or (in the majority of cases) its ἄτομα εἴδη figure as the *minor terms* of the demonstrative syllogisms which constitute the science; they are the subjects, of which the science demonstrates certain properties.

§ 8. But the articulated 'kind' which is the world of a science—a world, whose inhabitants are individual, and yet universal, substances—exists in fact and actually in, and as, an indefinite multiplicity of singular perceptible embodiments, each of which is a 'this-here-now', not a 'such-everywhere-and-always'. From this point of view, the province of the 'real', upon which a science reflects and which it has to explain, is a world of singular substances[2]—a world of αἰσθητά, rich with an inexhaustible detail of perceptible properties. It is a world manifest to concrete experience, i. e. to sense combined with intelligence; not a world manifest

[1] Cf. e. g. *Post. Anal.* 76^{a} 31–36, ^{b} 3–6, 11–13: and for the meaning of ὑπόθεσις, ὑποτίθεσθαι in this connexion, cf. e. g. 72^{a} 18–24, 76^{b} 16–19, 35–39, 93^{b} 24–25, &c. The 'kind', as that which the science ὑποτίθεται, is called the γένος ὑποκείμενον.

[2] 'Substances', in the sense in which Kallias and Sokrates are 'substances': cf. *Categ.* 2^{a} 11–14.

in toto to thought.[1] And out of this far richer (but only partly intelligible) world, science has to select the terms of its demonstrations—isolating by definition its substances, its properties, and its connecting causes.[2]

Some amongst the characters, which are predicable of the singular representatives of an ἄτομον εἶδος, are essential to their being, as the 'constitutive moments' of their essential nature. These, as we have seen, are formulated by the man of science as the definition of the ἄτομον εἶδος—of that individual, but yet universal, 'substance' (the *minor* term of the scientific demonstration) whose 'being' and 'meaning' he takes for granted.[3] The remaining characters may be grouped

[1] Under 'sense' I here include νόησις, so far as concerns the mathematical things: cf. *Metaph.* 1036ª 2–12.

[2] Science starts from a province of the 'real' presented to perception. The 'world of science' *in this sense* (viz. as that upon which the science reflects, which it endeavours to explain) is a world of singular substances, of αἰσθητά. But the 'real' which is made manifest by science (the 'world of science' as the adequate correlate of scientific explanation) is an intelligible articulated 'kind', an ordered sphere of 'commensurate' connexions between universal substances (types) and universal properties. The difficulty in Aristotle's position is that (i) he sometimes insists that the singulars (*this* man, *this* horse, &c.) alone are 'substances' in the proper and primary sense of the term (cf. e. g. *Categ.* and *Metaph.* ll. cc.): and yet (ii) he emphasizes the substantiality of the objects of φυσική in contrast to the adjectival character of the mathematical things (cf. above, § 5). We should have expected him *either* (i) to deny the self-subsistence of the perceptible singulars, i. e. to show that the αἰσθητά are only imperfectly 'real'—as indeed he sometimes does: *or* (ii) to insist that the intelligible world of φυσική, like the intelligible worlds of the mathematical sciences, is a world of adjectivals isolated by definition from the perceptible singular substances which they qualify; and that, therefore, the ἄτομα εἴδη of φυσική (e. g. 'man') are no more 'substantial' than 'the circle' or 'the number two'. Cf. *Metaph.* 1035ᵇ 27–31; and above, p. xxiii, note 1.

[3] Cf. above, § 7, and *Post. Anal.* 96ª 22 – ᵇ 14. In some of the demonstrations of a science the minor term may be the 'kind' itself, or some subaltern *genus*, i. e. some specification of the 'kind' *short of* (wider than) an ἄτομον εἶδος. This, however, does not affect the general principle of the doctrine. For the 'kind', or any subordinate specification of it, is predicable as a 'constitutive moment' in the

together as *πάθη* or *συμβεβηκότα*; and from amongst them the science selects its *major* terms, i. e. the properties whose 'meaning' it assumes, but whose 'being' it has to demonstrate.[1]

In the ideally-perfect scientific demonstration[2] the *πάθος*, which is the major term, must be 'commensurate' with the minor term. In other words, if e. g. the minor term is an *ἄτομον εἶδος*, the major term must be a property which (a) belongs to every singular representative of the *εἶδος*, and (b) belongs to the singulars as the necessary consequence of their 'essential nature'. Such a property is called a *καθ' αὑτὸ συμβεβηκός* (a *proprium*) of its subject. It attaches to that subject (viz., in the case supposed, to the *ἄτομον εἶδος*) as a whole, and can neither 'be' nor 'be defined' without the latter. It is found qualifying every singular representative of the *εἶδος*, and it qualifies (strictly-speaking)[3] no other singular substance. The judgement which affirms the inherence of a *proprium* in its subject asserts a precise, reciprocal, *nexus* between universals. Such a *nexus* is 'universal' (*καθόλου*) or 'commensurate': and it is the object of every ideally-perfect scientific demonstration to establish a mediated universal *nexus* of this kind.[4]

essential nature of all the singular representatives of an *ἄτομον εἶδος*: cf. above, p. xxiii, note 2.

[1] Cf. e. g. *Post. Anal.* 76[a] 32–36, [b] 6–16, &c. The 'meaning', which the man of science assumes, is (when explicitly formulated by him) a 'nominal definition' of the *πάθος*, a *λόγος τοῦ τί σημαίνει τὸ ὄνομα* (cf. e. g. *Post. Anal.* 93[b] 29–32). The 'being' of a *πάθος* is its inherence in its proper subject.

[2] i. e. in the *συλλογισμὸς τοῦ διότι* (in *demonstratio potissima*). The proofs actually occurring in any science may fall short of this ideal in various ways and degrees. Cf. e. g. *Post. Anal.* 74[a] 32 – [b] 4, 78[a] 22 – 79[a] 16.

[3] 'White-black-or-coloured' is a *proprium* of surface (*ἐπιφάνεια*). Hence, though Sokrates e. g. is white, 'white' really attaches not to Sokrates, but to the surface limiting the solid (*σῶμα*) which is isolable by definition as a quantitative character of Sokrates (cf. above, § 5). In relation to Sokrates 'white' is a *mere* coincident *πάθος*, a *mere συμβεβηκός*. It has no direct essential or necessary connexion with him *qua ζῷον λογικόν*.

[4] Thus e. g. geometry demonstrates that 'the triangle' (i. e. any triad of internal angles resulting from the enclosure of a surface by

It is true that Aristotle sometimes speaks as if, in certain regions of the province of *φυσική*, strict 'universal' connexions did not obtain; and as if, therefore, the 'ideal' of scientific demonstration must at times be set lower. Thus in astronomy the *φυσικός* demonstrates 'deprivation of light' of the moon; in meteorology he proves the occurrence of 'thunder' in the clouds; and, in what we should call 'physiology', he demonstrates becoming 'grey-haired' of man. But neither moon, nor clouds, nor man exhibit these *πάθη* invariably or commensurately. Man grows grey only as a general rule; the moon is frequently, but not always, eclipsed; and thunder occurs only occasionally in the clouds. Hence (Aristotle seems at times to maintain) the aim of the *φυσικός* is *sometimes* to establish connexions which are not timeless and not commensurate, but hold only as a general rule or for the most part.

But such apparent exceptions disappear on closer inspection. For the cause, which links such *πάθη* to their subjects, further determines and purifies either the *πάθη* or the subjects in such a way that the connexion *when demonstrated* (i. e. the *mediated nexus* which is the 'conclusion' of the *ἀπόδειξις*) is commensurate and reciprocal. Thus (not moon in general, but) moon in such a position that the earth screens it from the sun is deprived of light. And *this* deprivation of light—viz. one caused by the *ἀντίφραξις γῆς*—

three straight lines) 'is equal to two right angles'. The application to the isosceles is a mere corollary, and forms no part of the essential logical structure of the science (cf. e. g. *Post. Anal.* 73^{b} 26—74^{a} 3). *Propria* are 'essential' predicates (*καθ' αὑτά*) of their subjects in the second sense of *καθ' αὑτά* recognized by Aristotle (*ib.* 73^{a} 37 – ^{b} 3). For a predicate is *essential* (i) if it is a 'constitutive moment' in the being of its subject (cf. above, p. xxiii, note 3), or (ii) if it is a necessary consequence of its subject's being. In this second case, the *λόγος* which defines the predicate must contain the name (or the definition) of the subject as an element. Thus 'straight-or-curved' is a *proprium* of line and 'odd-or-even' of number. Every line must be either straight or curved, every number either odd or even, and nothing else can *as such* possess these properties. Moreover, it is impossible to define oddness or evenness (or straightness or curvedness) without specifying number (or line) in the definitory formula.

is lunar eclipse, a *proprium* of moon. Moon-*qua*-screened-by-the-earth is deprived of light commensurately and timelessly. And the noise, which is thunder, occurs inevitably and invariably in the clouds in so far as fire is quenched in them: *that* noise—viz. the noise caused by the quenching of fire—is a *proprium* of clouds.[1] Finally, growing grey is one amongst the alternatives of a 'disjunctive' *proprium* of man. For man, in so far as increasing age destroys the hair-sacs or follicles, must either grow grey or grow bald, as inevitably as number must be either odd or even, and line straight or curved.[2]

§ 9. In the ideally-perfect demonstration the *middle term* expresses the proximate (i. e. the precisely-adequate) cause of the inherence of the *proprium* in its commensurate subject.[3] Thus, given extinction of fire in the clouds, the noise which is thunder precisely and inevitably results: and, given the interposition of the earth screening the moon from the sun, that deprivation of light, which is a lunar eclipse, is the immediate and inevitable effect.[4] Aristotle identifies this cause, which appears as the middle term, with a definition of the major term.[5] And in fact, as we saw,[6] the *middle*

[1] This definition of thunder (*ψόφος ἀποσβεννυμένου πυρὸς ἐν νέφεσιν*), which Aristotle constantly quotes in illustration, appears to be derived from the views of Anaxagoras. Aristotle's own theory of thunder is different: cf. *Meteor.* 369ª 10—370ª 33.

[2] I have no doubt that this is the true doctrine, and the only one which is consistent with Aristotle's general conception of *ἀποδεικτικὴ ἐπιστήμη*: cf. e. g. *Post. Anal.* 75ᵇ 33–36, 98ª 35 – ᵇ 38. Aristotle, however, hesitates: and the reason of his hesitation is his anxiety to maintain man's freedom as an agent, which appeared to him to demand a real indeterminateness in certain parts of nature (cf. *de Interpr.* 18ª 28—19ª 22, *Pr. Anal.* 32ᵇ 13–22, *Post. Anal.* 87ᵇ 19–27). Hence he sometimes treats imperfect stages in the development of a scientific demonstration as if they were distinct, though inferior, types of *ἀπόδειξις*.

[3] *τὸ πρῶτον αἴτιον* (cf. e. g. *Post. Anal.* 78ª 24–26).

[4] Another example is the demonstration that 'broad-leaved shrubs must lose their leaves' through the *middle πῆξις τοῦ ὑγροῦ*, or *διὰ τὸ πήγνυσθαι τὸν ἐν τῇ συνάψει τοῦ σπέρματος ὀπόν*: cf. *Post. Anal.* 98ª 35 ff., ᵇ 32–38, 99ª 21–29.

[5] *λόγος τοῦ πρώτου ἄκρου*, *Post. Anal.* 99ª 21–29: cf. also 93ᵇ 3–14.

[6] Above, p. xxvii.

helps to define the *major* (and sometimes also the *minor*) and thus purifies the connexion, rendering it 'commensurate'.

In so far, therefore, as a man of science achieves the knowledge which is his aim, and succeeds in expressing it in the ideally appropriate form, his science will appear as an ordered system of apodeictic syllogisms. In these syllogisms every term will be universal; and *in the basal syllogisms*, on which the system depends, every premiss will be an immediate 'commensurate' judgement, reflecting an immediate reciprocally-necessary *nexus* between substance and *proprium*, or substance and 'constitutive moment', or proximate cause and proximate effect. The conclusion of every syllogism will include the middle term and will be a mediate 'commensurate' judgement, reflecting a reciprocally-necessary *nexus* between substance and *proprium* mediated through the proximate cause of the inherence of the latter in the former. The three terms of every such apodeictic syllogism can be rearranged and concentrated so as to constitute the adequate scientific definition of the *proprium* in question. Thus Anaxagoras's definition of 'thunder'[1] is the concentration of the three terms of a scientific demonstration, and includes (a) the clouds as the subject in which, (b) owing to the extinction of fire, (c) that determinate noise, which 'thunder' means, must occur. And the adequate definition of 'lunar eclipse' is a λόγος including all three terms of a *συλλογισμὸς τοῦ διότι*. For it states (a) the moon (the minor term) in which, (b) owing to *γῆς ἀντίφραξις* (the middle term), (c) that deprivation of light (the major term), which 'eclipse' means, must occur.[2]

[1] Cf. above, p. xxviii, note 1.

[2] Cf. e.g. *Post. Anal.* 71^{b}19–25, 84^{b}19—85^{a}1, 94^{a}1–14. The scientific definition of *μίξις* (see below, *28^{b}22) is a good example of a concentrated apodeictic syllogism.

None of Aristotle's examples completely fulfils the conditions of a perfect apodeictic syllogism, adapted to form the basis of a system of scientific demonstrations. The instances quoted above ('thunder', 'eclipse', 'shedding of leaves') are derivative syllogisms: their minor premisses are not immediate, and their middle terms are neither 'constitutive moments' nor *propria* of their minor terms. Yet the

It is to be observed that, if we take the major and minor terms of an apodeictic syllogism without the middle, we get a *formula* (λόγος) which is the 'nominal definition'[1] of a πάθος. Thus 'noise in the clouds', 'deprivation of light in the moon', 'unification of the combinable bodies' (τῶν μικτῶν ἕνωσις) are the nominal definitions of βροντή, ἔκλειψις, and μίξις respectively. And if we expand these *formulae* into judgements ('In the clouds there is noise', 'In the moon there is deprivation of light', 'The combinable bodies exhibit unification'), we get in each instance that unmediated suggestion of a demonstrable connexion which Aristotle calls a πρόβλημα.[2] The man of science starts with a suggested connexion of this kind—with a proposed conclusion. His aim is to mediate it, to find a middle or middles which will convert it into a demonstrated truth. Hence Aristotle sometimes represents him as filling up the interval between subject and predicate of the πρόβλημα, by interpolating the middle or middles which are required to 'pack' the whole interval with 'elementary', immediate, or self-evident connexions.[3]

schema of the ideally-perfect basal demonstrative syllogism, according e. g. to *Post. Anal.* 71^{b} 19–25, is :—

B precisely and reciprocally carries with it A, for B is A's proximate cause ; C immediately and inevitably involves B (either because B is a 'constitutive moment' of C's being, or because B is a *proprium* immediately flowing from C's essential nature) ;

Therefore C is commensurately linked with A through B.

The favourite example of the old commentators is :—

Rationality (i. e. reason embodied in an animal organism) carries with it, precisely and reciprocally, the power to laugh (i. e. the power to express the intelligent appreciation of the ludicrous by a determinate modification of breathing) ;

Man immediately and inevitably involves rationality, as the specific *differentia* constituting his being ;

Therefore Man *qua* λογικόν—and only Man—must be γελαστικόν.

[1] Cf. above, p. xxvi, note 1.

[2] Cf. e. g. *Post. Anal.* 98^{b} 32.

[3] Cf. e. g. *Post. Anal.* 84^{b} 19—85^{a} 1. Aristotle's conception of ἀπόδειξις, looked at from this point of view, is in principle identical with Descartes' conception of 'deductio' : see my *Essay on the Nature of Truth*, pp. 69-72.

§ 10. The composite perceptible substance, which the *φυσικός* studies in so far as it is changeable,[1] is displayed in our experience as a multiplicity of 'natural bodies' (*φυσικὰ σώματα*). A 'natural' body is one which contains, innately inherent in it, 'an originative source of motion and rest' (*ἀρχὴ κινήσεως καὶ στάσεως*) or 'an impulse to change' (*ὁρμὴ μεταβολῆς ἔμφυτος*). This *ἀρχή* is the *φύσις* of the body, as the 'form' which constitutes it, distinguishing a *natural* from a *mathematical* body (a 'solid') and from a product of *τέχνη*.[2] The 'kind', which is the world of natural philosophy, may be most simply and adequately called *σῶμα φυσικόν*. It is the business of the *φυσικός* to demonstrate of the 'kind' itself, and of the subordinate *genera* and *ἄτομα εἴδη* into which it is articulated, the *propria* which commensurately attach to them.[3]

The 'kind' itself—*φυσικὸν σῶμα* in general—is the subject of Aristotle's *Physics*, the first[4] in the series of his works on natural philosophy. In it he discusses (i) *πρώτη ὕλη* and 'the contraries' (*εἶδος, στέρησις*), as the fundamental 'constitutive moments' of all *φυσικὰ σώματα* which are *γεννητὰ καὶ φθαρτά*: (ii) *φύσις*, i. e. the originative source of motion and rest which constitutes all *φυσικὰ σώματα*, whether eternal or perishable: (iii) motion, the *proprium* of all *φυσικὰ σώματα*: (iv) place, time, and continuity, which are predicable of natural body and are necessarily implied in motion: (v) the infinite and the void, which are erroneously supposed to be implied by moving bodies: and so forth.[5]

Next in the systematic order is the *de Caelo*, in which Aristotle studies the 'simple' or elementary natural bodies, in so far as they form so many *strata* composing the physical

[1] Cf. above, p. xviii. [2] Cf. e. g. *Phys.* B. 1.

[3] In what follows I have drawn freely upon Zabarella's *De naturalis scientiae constitutione* (pp. 2–134 in his *De rebus naturalibus*, Francofurti, MDCXVII). In that admirable work the reader will find an excellent account of the subject-matter of *φυσική* and a most thorough discussion of the systematic connexion of Aristotle's 'physical' writings.

[4] *First* in the systematic or logical order, not necessarily first in the order of writing.

[5] Cf. Zabarella, l. c., pp. 16–39.

universe. For the natural bodies comprised within the physical universe are either (i) 'simple',[1] or (ii) complex, resulting from the combination or composition of pieces of the simple bodies. Now the 'nature' of a 'simple' natural body is expressed in a 'simple' motion. A simple motion is *either* rectilinear ('up' or 'down', i. e. from the centre towards the periphery of the universe, or *vice versa*) *or* circular. And Aristotle recognizes five simple natural bodies as composing the physical universe; viz. the Aether, whose 'nature' it is to move eternally in a circle, and Earth, Air, Fire, and Water whose 'natures' are expressed in rectilinear motion.[2] Earth, Air, Fire, and Water are concrete of form and matter (for they are informations of *πρώτη ὕλη*), and they together compose the 'Lower Cosmos' or the 'sublunary sphere'—i. e. that part of the physical universe which extends from the earth to the region immediately below the moon. Earth inherently gravitates towards the centre of the universe, and at the centre it is 'by nature' at rest. It is thus the nature of Earth to 'underlie' all other bodies; and it is therefore absolutely heavy, and forms the lowest *stratum*. Water inherently moves towards a region (or constitutes a *stratum*) immediately encircling the Earth; and is therefore light relatively to Earth, and heavy relatively to Air and Fire. Air 'by nature' moves up towards a region (or constitutes a *stratum*) immediately encircling the Water; and is therefore heavy relatively to Fire, but light relatively to Water and Earth. And Fire is absolutely light: for it is its 'nature' to rise above the other three, to 'float on their surface', and thus to constitute the uppermost *stratum* of the Lower Cosmos.[3]

[1] They are *ἁπλᾶ σώματα*, though they are *σύνθετοι οὐσίαι*, i. e. concrete of form and matter: cf. e. g. below, * 22^{b} 1–2.

[2] Cf. *de Caelo* 268^{b} 14—269^{a} 9. Since there are *three* 'simple' motions (from the centre, to the centre, and round the centre), Aristotle sometimes speaks of *three* simple bodies:—viz. (i) the Aether, which is eternally revolving and constitutes the outermost shell of the physical universe, (ii) Earth, which gravitates towards, and rests at, the centre, and (iii) the 'intermediate body', which moves from the centre towards the periphery and includes the three *strata*, Water, Air, and Fire. Cf. *de Caelo* 270^{b} 26–31, 277^{b} 12–17, 298^{b} 6–8.

[3] Cf. *de Caelo* 269^{b} 20–29, 308^{a} 14–33, 311^{a} 15 ff. This rough

The remainder of the physical universe consists of the fifth simple body, the Aether. It constitutes the whole of the Upper Cosmos—i. e. the outermost shell of the heavens (the *πρῶτος οὐρανός*) and the stars which are set in it, and the planetary spheres together with the planets which they carry. Since its motion is circular, and neither 'up' nor 'down', it is neither light nor heavy. It is unchangeable, ungenerated and imperishable, and in general contrasted in all its properties with the other four simple bodies.[1] Many passages in the *de Caelo* are devoted to the study of this elusive substance, which is in its own way as full of contradictions as the 'Ether' of modern physical science. We are, in fact, confronted here with one of the most obscure features in Aristotle's natural philosophy.[2] The Aether, the stars, and the planets, although 'divine' or 'heavenly' bodies, are yet included in the province of *φυσική*: and Aristotle undoubtedly regards them as in some sense *φυσικὰ σώματα*. The stars and planets are perceptible substances, and 'all perceptible substances have matter'.[3] They must, indeed, *qua* perceptible be concrete of form and matter: for perception is the presence, in the soul of the percipient, of the form abstracted from the matter of the perceptible thing.[4] Are we then to regard the Aether as the 'matter' of the stars and planets, and the Intelligences, which initiate and control the motions of the spheres,[5] as the souls informing their aetherial bodies? But the Aether itself is a 'simple' *natural* body: hence it must be concrete of form and matter, and ought to be perceptible. And if it is the 'matter' of the stars and planets, it is their proximate matter, itself the information of a more primary matter; just as Earth, Air, Fire, and Water, though the proximate materials of the compound bodies, are themselves informations of *πρώτη ὕλη*.

sketch of the constitution of the Lower Cosmos is filled in, and to some extent modified, below: cf., in the meantime, * 22^{b} 2–3, * 23^{a} 6–8.

[1] Cf. e. g. *de Caelo* 269^{b} 29—270^{a} 35.

[2] Cf. also above, p. xix, note 3, and p. xxii, note 1.

[3] *Metaph.* 1042^{a} 25.

[4] Cf. *de Anima* 424^{a} 17–24, 431^{b} 20—432^{a} 3.

[5] Cf. e. g. *Metaph.* 1073^{a} 14–^{b}3, *de Caelo* 292^{a} 18 ff.

It is equally clear, from another consideration, that the Aether, the stars, and the planets must all involve 'matter' of some kind. For though they are eternal and unchangeable, they all are in ceaseless motion: and motion involves matter in the moving thing. For the moving thing occupies successively, and not simultaneously, the different points on its path. It is *now* actually *here* and only potentially *there*: and *now* actually *there*, no longer actually *here*, and only potentially at a third point. Accordingly Aristotle ascribes to the heavenly bodies—and his argument applies to the Aether as well as to the stars and planets[1]—a ὕλη πόθεν ποῖ (or a ὕλη τοπική), though he denies of them ὕλη in any other sense. Clearly they cannot contain the matter which is involved in the perishable and changing things, the ὕλη γενητὴ καὶ φθαρτή or the matter of αὔξησις or of ἀλλοίωσις: for, if they did, they would themselves be subject to γένεσις and φθορά, to αὔξησις and φθίσις, and to ἀλλοίωσις.[2]

It is tempting to connect the ὕλη πόθεν ποῖ with the ὕλη νοητή which is the 'matter' of the mathematical planes and solids, i. e. with the empty extensity which may be informed e.g. by circularity to constitute *this* or *that* geometrical circle.[3] If so, then the Aether is a σύνθετος οὐσία (and thus a proper object of φυσική) *qua* concrete of νοητὴ ὕλη and mathematical form: and it is 'perceptible' only in the sense in which *this* or *that* geometrical circle or sphere is 'perceptible', viz. intuitable, imaginable, 'perceptible' to the mind's eye, an object of νόησις and not of αἴσθησις.[4]

The stars and planets, it would seem, are *analogous* to the

[1] It is primarily the aetherial spheres which 'move', carrying the stars and planets round in their revolutions: cf. e.g. *de Caelo* 289^{b} 30 ff.

[2] Cf. *Metaph.* 1042^{a} 25 – ^{b} 7, 1050^{b} 16–28, 1069^{b} 24–26.

[3] We cannot *identify* ὕλη πόθεν ποῖ with the ὕλη of the geometrical planes and solids. For the latter are devoid of motion, whilst the ὕλη πόθεν ποῖ is primarily intended to account for the motion which characterizes the Aether and the heavenly bodies. Still we may perhaps suppose that the 'stuff', which is informed as these moving spheres, is (if we disregard its potentiality for motion) the same as the νοητὴ ὕλη involved in *this* or *that* circle or sphere.

[4] Cf. e.g. *Metaph.* 1036^{a} 2–12, 1036^{b} 32—1037^{a} 5.

living things of the sublunary sphere. They are pieces of aetherial stuff besouled by an Intelligence which initiates and controls the motions of their spheres. The Aether is thus their 'matter' in a sense *remotely analogous* to that in which pieces of Earth, Air, Fire, and Water are the 'matter' of the perishable living things. The Aether itself is an information of ὕλη πόθεν ποῖ, a substance concrete of form and matter, and thus a φυσικὸν σῶμα. Its φύσις is an inherent tendency to revolve; and, in obeying the initiation of the Intelligence, its revolution is both divinely inspired and 'natural'. We do not 'see' the Aether, except in the sense in which we 'see'—i. e. imaginatively visualize—the geometrical planes and solids. We suppose ourselves to see the stars and planets; but we do not see them as they really are, i. e. we do not see aetherial stuff alive with besouling Intelligence. We see moving solids, solids with such and such shapes and orbits; and we also see (and ascribe to the moving solids) the flames, which the revolving aetherial spheres cause by friction in the immediately subjacent *stratum*.[1]

If this is Aristotle's doctrine, it is difficult to see why the aetherial spheres, and the bodies they contain, should fall within the province of φυσική at all. For—apart from the Intelligences besouling them—they are 'concrete of form and matter' and 'perceptible' only in the sense in which the mathematical things are so. Yet Aristotle insists that the aetherial spheres, the stars, and the planets are not 'adjectivals', but substances,[2] and substances in a very special sense. For each of them is the unique singular representative of a species, i. e. is both an ἄτομον εἶδος and an actually-existent singular. Hence they are 'eternal substances' and yet 'perceptible', timelessly-actual species, sole individuals in which the type is precisely and completely fulfilled. Here—and here alone—the subjects of demonstrative science are 'substances' both

[1] Cf. *de Caelo* 289ª 19–35, where Aristotle ascribes the apparent light and heat of the stars and planets to this cause. There is a more exact statement of this curious theory in *Meteor.* A. 3, where, however, Aristotle is referring only to the heat, and primarily to the heat of the sun. Cf. also * 22ᵇ 2–3.

[2] Cf. also above, p. xix, note 3.

universal and sheerly singular. The subject, e. g., of which 'eclipse' is demonstrated, is *the* moon: and *the* moon is identically also *this* moon.[1]

§ 11. Next to the *de Caelo* in the systematic order, if not also in the order of writing,[2] comes the present treatise. The πάθη here primarily in question are γένεσις and φθορά. Aristotle distinguishes them from the other forms of change (ἀλλοίωσις, αὔξησις and φθίσις) which occur in the natural bodies of the Lower Cosmos, and demonstrates their 'inherence' in their 'proper subject'. But what is this proper subject? What is the minor term of which γένεσις and φθορά are demonstrated?

All the natural bodies of the Lower Cosmos are γεννητὰ καὶ φθαρτά, and γένεσις and φθορά are therefore *propria* (or a *proprium*) of them all. The proper or commensurate subject, of which these πάθη are demonstrated, must accordingly be taken to include all the natural bodies in the sublunary sphere. And Aristotle does in fact treat in full of the γένεσις and φθορά of the 'simple' natural bodies (Earth, Air, Fire, and Water), and refers, though only incidentally, to the γένεσις and φθορά of the most complex of the natural bodies, i. e. to the birth and death of the living things.[3]

Nevertheless, if we look more closely at the contents of the treatise, we shall find that Aristotle is *primarily* concerned with the γένεσις and φθορά of the ὁμοιομερῆ. These are the first, or most rudimentary, compound natural bodies, resultants of the combination (μίξις) of pieces of Earth, Air, Fire, and Water.[4] And Aristotle explains the γένεσις and φθορά of the 'simple' bodies because they are the proximate material constituents of the ὁμοιομερῆ, and because their combination (which produces the ὁμοιομερῆ) necessarily implies their γένεσις and φθορά. Aristotle's references to the

[1] Cf. *Post. Anal.* 74ᵃ 7–8, ᵃ 16–17, ᵃ 33–34. Aristotle's illustrations are fictitious ones, drawn from plane geometry; but his doctrine applies, without any fiction, to astronomical demonstrations, if my account of his astronomical views is correct.

There is an interesting discussion of the Aether in Zabarella's *De Natura Cœli*.

[2] Cf. below, * 14ᵃ 1.

[3] Cf. below, e. g. * 28ᵇ 32–33.

[4] Cf. below, e. g. * 14ᵃ 19.

γένεσις and φθορά of the living things are quite general and vague. There is no discussion of these πάθη *qua* distinctive of the ἔμψυχα, no treatment of the birth and death which are the 'coming-to-be' and the 'passing-away' of an organic-body-vitalized-by-soul. The living things, however, in their birth and death share in the γένεσις and φθορά of the ὁμοιομερῆ: for the σῶμα ἔμψυχον is a σῶμα ὀργανικόν, and every ὄργανον is a σύνθεσις of ὁμοιομερῆ.[1] Hence, to this limited extent, Aristotle's treatment, though primarily directed to elucidate the γένεσις and φθορά of the ὁμοιομερῆ, applies also to the coming-to-be and passing-away of the ἔμψυχα.[2]

§ 12. The following brief outline may be of service to the reader:—

(i) **A. 1–5** (314ª 1—322ª 33). The πάθη which are to be demonstrated—viz. coming-to-be and passing-away, growth and diminution, alteration—are distinguished from one another by precise definitions of the meaning of the terms. Incidentally (a) the discussion establishes (against the views of some of the early Greek philosophers) the occurrence of coming-to-be and passing-away as changes distinct from *alteration* and again from *the composition and dissolution of an aggregative whole*: and (b) πρώτη ὕλη is shown to be presupposed as the ground of γένεσις and φθορά, and of their never-failing alternation in the Lower Cosmos.

Growth and diminution are fully discussed in chapter 5. Aristotle restricts the meaning of the terms to growth and diminution *proper*, i.e. in the ἔμψυχα.

(ii) **A. 6–10** (322ᵇ 1—328ᵇ 22). The second part of Aristotle's task is to discover and define the causes of coming-to-be and passing-away, in order that we may be in a position to *demonstrate* the 'inherence' of these πάθη in their proper subject

[1] Cf. below, e.g. * 21ᵇ 17–19, * ᵇ 19–22.

[2] Cf. Zabarella, *De nat. sc. constitutione*, pp. 56–61. His view is summarized thus (p. 61 C, D): 'In libris . . . de generatione dicimus agi et de caduco corpore generaliter, et de misto generaliter, quia nullus est alius liber naturalis, in quo vel de hoc vel de illo agatur; sed hoc eo modo, quem declaravimus, intelligendum est, ut generatio ita in rebus inesse cognoscatur, ut revera inest, misto ut subiecto praecipuo, elementis ut principiis, corpori autem caduco ut subiecto adaequato,' etc.

and thus to formulate their adequate scientific definitions.[1] Now Earth, Air, Fire, and Water are the proximate matter (the material constituents) of the *ὁμοιομερῆ*, and thus mediately the matter of all the complex natural bodies which come-to-be: and they constitute the *ὁμοιομερῆ* by combination (*μίξις*). Combination implies Action and Passion (*ποιεῖν καὶ πάσχειν*), and Action and Passion imply Contact (*ἀφή*). Hence Aristotle discusses, explains, and defines *ἀφή* (*A.* 6), *ποιεῖν–πάσχειν* (*A.* 7–9), and *μίξις* (*A.* 10).

(iii) **B. 1–8** ($328^{b}26$—$335^{a}23$). These chapters contain a thorough and exhaustive investigation of the so-called 'elements' (Earth, Air, Fire, and Water) as the material constituents of the compound natural bodies, and of those reciprocal transformations of the 'elements' which are necessarily implied in their combination to form the *ὁμοιομερῆ*.

(iv) **B. 9–11** ($335^{a}24$—$338^{b}19$). These chapters contain (a) a brief discussion of the material and formal causes of coming-to-be (*B.* 9); (b) a short account of the final cause, and an elaborate account of the efficient cause, together with an explanation of the 'continuity' of coming-to-be (*B.* 10); (c) a proof that any continuous coming-to-be which is cyclical (i.e. any sequence of events which is unbroken and returns upon itself) exhibits *genuine*, as well as *conditional*, necessity.

[1] Cf. above, § 9.

ΑΡΙΣΤΟΤΕΛΟΥΣ

ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ

SIGLA

E = cod. Parisiensis Regius 1853

E^2 = quae in eodem codice, manu tamen recentiore addita vel correcta, leguntur

J = cod. Vindobonensis, phil. Graec. 100

J^2 = quae in eodem codice manu recentiore addita a lectionibus libri L differunt (vide praefationem)

F = cod. Laurentianus 87. 7

F^2 = quae in eodem codice manu recentiore addita vel correcta commemoratione digna videbantur

H = cod. Vaticanus 1027

L = cod. Vaticanus 253

Quinque tantum locis citatur etiam

D^b = cod. Ambrosianus F. 113 sup.

Γ = versio Latina commentariis ab Averroe in Aristotelis opera conscriptis inclusa et impressa Venetiis anno 1483 ab Andrea Asulano

Φ, Φ^l, Φ^c Philoponi commentaria, Hieronymi Vitelli studio Berolini anno 1897 edita, respiciunt. Scilicet Φ = lectio quae eadem et in lemmate exhibetur et in commentario tractatur: Φ^l = lectio quae non nisi in lemmate continetur: Φ^c = lectio quae, quamvis in lemmate non reperiatur, in commentario tamen citatur vel e commentario colligenda videtur. Denique dissidentia librorum, quibus Vitelli in constituendo Philoponi textu usus est, siglis post Φ, Φ^l, et Φ^c adiectis interdum notatur. Itaque, exempli gratia, lectionem Philoponi codicum R et Z auctoritate, invitis ceteris, in lemmate receptam siglo Φ^l (codd. RZ) significavi.

ΑΡΙΣΤΟΤΕΛΟΥΣ

ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ Α

Περὶ δὲ γενέσεως καὶ φθορᾶς τῶν φύσει γινομένων καὶ 314ᵃ
φθειρομένων, ὁμοίως κατὰ πάντων, τάς τε αἰτίας διαιρε-
τέον καὶ τοὺς λόγους αὐτῶν, ἔτι δὲ περὶ αὐξήσεως καὶ ἀλ-
λοιώσεως, τί ἑκάτερον, καὶ πότερον τὴν αὐτὴν ὑποληπτέον
εἶναι φύσιν ἀλλοιώσεως καὶ γενέσεως, ἢ χωρίς, ὥσπερ 5
διώρισται καὶ τοῖς ὀνόμασιν. τῶν μὲν οὖν ἀρχαίων οἱ μὲν τὴν
καλουμένην ἁπλῆν γένεσιν ἀλλοίωσιν εἶναί φασιν, οἱ δ' ἕτε-
ρον ἀλλοίωσιν καὶ γένεσιν. ὅσοι μὲν γὰρ ἕν τι τὸ πᾶν εἶναι
λέγουσι καὶ πάντα ἐξ ἑνὸς γεννῶσι, τούτοις μὲν ἀνάγκη
τὴν γένεσιν ἀλλοίωσιν φάναι καὶ τὸ κυρίως γιγνόμενον ἀλ- 10
λοιοῦσθαι· ὅσοι δὲ πλείω τὴν ὕλην ἑνὸς τιθέασιν, οἷον Ἐμ-
πεδοκλῆς καὶ Ἀναξαγόρας καὶ Λεύκιππος, τούτοις δὲ ἕτε-
ρον. καίτοι Ἀναξαγόρας γε τὴν οἰκείαν φωνὴν ἠγνόησεν—λέ-
γει γοῦν ὡς τὸ γίγνεσθαι καὶ ἀπόλλυσθαι ταὐτὸν καθέστηκε
τῷ ἀλλοιοῦσθαι, πολλὰ δὲ λέγει τὰ στοιχεῖα, καθάπερ καὶ 15
ἕτεροι. Ἐμπεδοκλῆς μὲν γὰρ τὰ μὲν σωματικὰ τέτταρα,
τὰ δὲ πάντα μετὰ τῶν κινούντων ἓξ τὸν ἀριθμόν, Ἀνα-
ξαγόρας δὲ ἄπειρα καὶ Λεύκιππος καὶ Δημόκριτος (ὁ μὲν
γὰρ τὰ ὁμοιομερῆ στοιχεῖα τίθησιν, οἷον ὀστοῦν σάρκα
μυελὸν καὶ τῶν ἄλλων ὧν ἑκάστῳ συνώνυμον τὸ μέρος ἐστίν, 20
Δημόκριτος δὲ καὶ Λεύκιππος ἐκ σωμάτων ἀδιαιρέτων τἆλ-

a 1 δὲ om. E 3 αὐτῶν διοριστέον ἔτι F 5 φύσιν εἶναι L : εἶναι φύσιν εἶναι E¹ 6 διώρισται] καὶ ὥρισται E¹ μὲν τὴν] μὲν οὖν τὴν E 8–9 λέγουσιν εἶναι EL 9 γεννῶσι] γεγονέναι H, et fecit E μὲν om. H : μὲν δὴ F 10 ἀλλοίωσιν τὴν γένεσιν H γιγνόμενον καὶ ἀλλοιοῦσθαι F 12 δὲ om. F¹HL 13 γε om. FH 14 οὖν . . . ἀπόλλυσθαι in litura add. J, prima tamen manu καὶ τὸ F ταυτὸ FJL 16 μὲν prius om. HL 19 οἷον om. H καὶ post ὀστοῦν add. HL καὶ post σάρκα add. FHL 20 μυελὸν καὶ ξύλον καὶ H καὶ τῶν] τῶν δὲ E ἑκάστου FHLΦᶜ συνωνύμως FL : συνώνυμον post μέρος H ἐστίν] κατηγορεῖται L 21 τἆλλα] ταῦτα EF : haec et alia Γ

λα συγκεῖσθαί φασι, ταῦτα δ' ἄπειρα καὶ τὸ πλῆθος εἶναι καὶ τὰς μορφάς, αὐτὰ δὲ πρὸς αὐτὰ διαφέρειν τούτοις ἐξ ὧν εἰσι καὶ θέσει καὶ τάξει τούτων)· ἐναντίως γὰρ φαίνονται λέγοντες οἱ περὶ Ἀναξαγόραν τοῖς περὶ Ἐμπεδοκλέα. ὁ μὲν γάρ φησι πῦρ καὶ ὕδωρ καὶ ἀέρα καὶ γῆν στοιχεῖα τέτταρα καὶ ἁπλᾶ εἶναι μᾶλλον ἢ σάρκα καὶ ὀστοῦν καὶ τὰ τοιαῦτα τῶν ὁμοιομερῶν· οἱ δὲ ταῦτα μὲν ἁπλᾶ καὶ στοιχεῖα, γῆν δὲ καὶ πῦρ καὶ ὕδωρ καὶ ἀέρα σύνθετα—παν-
314b σπερμίαν γὰρ εἶναι τούτων. τοῖς μὲν οὖν ἐξ ἑνὸς πάντα κατασκευάζουσιν ἀναγκαῖον λέγειν τὴν γένεσιν καὶ τὴν φθορὰν ἀλλοίωσιν, ἀεὶ γὰρ μένειν τὸ ὑποκείμενον ταὐτὸ καὶ ἕν (τὸ δὲ τοιοῦτον ἀλλοιοῦσθαί φαμεν)· τοῖς δὲ τὰ γένη πλείω ποιοῦσι διαφέρειν τὴν ἀλλοίωσιν τῆς γενέσεως—συνιόντων γὰρ καὶ διαλυομένων ἡ γένεσις συμβαίνει καὶ ἡ φθορά. διὸ λέγει τοῦτον τὸν τρόπον καὶ Ἐμπεδοκλῆς, ὅτι "φύσις οὐδενός ἐστιν . . . ἀλλὰ μόνον μίξις τε διάλλαξίς τε μιγέντων". ὅτι μὲν οὖν οἰκεῖος ὁ λόγος αὐτῶν τῇ ὑποθέσει οὕτω φάναι, δῆλον, καὶ ὅτι λέγουσι τὸν τρόπον τοῦτον· ἀναγκαῖον δὲ καὶ τούτοις τὴν ἀλλοίωσιν εἶναι μέν τι φάναι παρὰ τὴν γένεσιν, ἀδύνατον μέντοι κατὰ τὰ ὑπ' ἐκείνων λεγόμενα. τοῦτο δ' ὅτι λέγομεν ὀρθῶς, ῥᾴδιον συνιδεῖν. ὥσπερ γὰρ ὁρῶμεν ἠρεμούσης τῆς οὐσίας ἐν αὐτῇ μεταβολὴν κατὰ μέγεθος, τὴν καλουμένην αὔξησιν καὶ φθίσιν, οὕτω καὶ ἀλλοίωσιν· οὐ μὴν ἀλλ' ἐξ ὧν λέγουσιν οἱ πλείους ἀρχὰς ποιοῦντες μιᾶς ἀδύνατον ἀλλοιοῦσθαι. τὰ γὰρ πάθη, καθ' ἃ φαμεν τοῦτο συμβαίνειν, διαφοραὶ τῶν στοιχείων εἰσίν, λέγω δ' οἷον θερμὸν ψυχρόν, λευκὸν μέλαν, ξηρὸν ὑγρόν, μαλακὸν σκληρὸν καὶ τῶν ἄλλων ἕκαστον, ὥσπερ καὶ φησὶν Ἐμπεδοκλῆς "ἠέλιον μὲν λευκὸν ὁρᾶν καὶ θερμὸν ἁπάντῃ, ὄμβρον δ' ἐν πᾶσιν

a 22 φησι L εἶναι post μορφάς F 23 πρὸς αὐτὰ FH διαφέρει F 24 γὰρ] δὲ FHLΦ¹ 25 περὶ τὸν Ἀναξαγόραν F 26 ὁ] οἱ FΓ φασι Γ στοιχεῖα εἶναι F 27 τέτταρα om. sed Ā supra lin. add. J μᾶλλον εἶναι F 28 ὁμοιομερῶν] μερῶν F : similium partium Γ 29 γῆν . . . ὕδωρ] πῦρ δὲ καὶ ὕδωρ E¹ καὶ post πῦρ om. F b 3 μένει J (sed post μένει erasum aliquid) et Φ¹, Bonitz 4 δὲ prius om. E 5 τὴν γένεσιν τῆς ἀλλοιώσεως fecit E 7 λέγει καὶ τοῦτον L 8 τε καὶ διάλλαξίς τε L 9 et 11 φᾶναι J 10 καὶ ὅτι] ὅτι καὶ E 11 τι] τοι F 12 ὑπ' ἐκείνων fecit E 16 ποιοῦνται L 19 λευκὸν] καὶ H σκληρὸν μαλακὸν EL 20 καὶ φησὶν] φησὶ καὶ F 21 ὁρᾶν] ὅρα EL

δνοφόεντά τε ῥιγαλέον τε" (ὁμοίως δὲ διορίζει καὶ ἐπὶ τῶν λοιπῶν)· ὥστ' εἰ μὴ δυνατὸν ἐκ πυρὸς γίνεσθαι ὕδωρ μηδ' ἐξ ὕδατος γῆν, οὐδ' ἐκ λευκοῦ μέλαν ἔσται οὐδὲν οὐδ' ἐκ μαλακοῦ σκληρόν (ὁ δ' αὐτὸς λόγος καὶ περὶ τῶν ἄλλων), τοῦτο δ' ἦν ἀλλοίωσις. ᾗ καὶ φανερὸν ὅτι μίαν ἀεὶ τοῖς ἐναντίοις ὑποθετέον ὕλην, ἄν τε μεταβάλλῃ κατὰ τόπον, ἄν τε κατ' αὔξησιν καὶ φθίσιν, ἄν τε κατ' ἀλλοίωσιν. ἔτι δ' ὁμοίως ἀναγκαῖον εἶναι τοῦτο καὶ ἀλλοίωσιν· εἴτε γὰρ ἀλλοίωσίς ἐστι, καὶ τὸ ὑποκείμενον ἓν στοιχεῖον καὶ μία πάντων ὕλη τῶν ἐχόντων εἰς ἄλληλα μεταβολήν, κἂν εἰ τὸ ὑποκείμενον ἕν, ἔστιν ἀλλοίωσις. Ἐμπεδοκλῆς μὲν οὖν ἔοικεν ἐναντία λέγειν καὶ πρὸς τὰ φαινόμενα καὶ πρὸς αὐτὸν αὐτός. ἅμα μὲν γὰρ οὔ φησιν ἕτερον ἐξ ἑτέρου γίνεσθαι τῶν στοιχείων οὐδέν, ἀλλὰ τἆλλα πάντα ἐκ τούτων, ἅμα δ' ὅταν εἰς ἓν συναγάγῃ τὴν ἅπασαν φύσιν πλὴν τοῦ νείκους, ἐκ τοῦ ἑνὸς γίγνεσθαι πάλιν ἕκαστον· ὥστ' ἐξ ἑνός τινος δῆλον ὅτι διαφοραῖς τισι χωριζομένων καὶ πάθεσιν ἐγένετο τὸ μὲν ὕδωρ τὸ δὲ πῦρ, καθάπερ λέγει τὸν μὲν ἥλιον λευκὸν καὶ θερμόν, τὴν δὲ γῆν βαρὺ καὶ σκληρόν. ἀφαιρουμένων οὖν τούτων τῶν διαφορῶν (εἰσὶ γὰρ ἀφαιρεταὶ γενόμεναί γε) δῆλον ὡς ἀνάγκη γίγνεσθαι καὶ γῆν ἐξ ὕδατος καὶ ὕδωρ ἐκ γῆς, ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον, οὐ τότε μόνον ἀλλὰ καὶ νῦν, μεταβάλλοντά γε τοῖς πάθεσιν. ἔστι δ' ἐξ ὧν εἴρηκε δυνάμενα προσγίνεσθαι καὶ χωρίζεσθαι πάλιν, ἄλλως τε καὶ μαχομένων ἀλλήλοις ἔτι τοῦ νείκους καὶ τῆς φιλίας, διόπερ καὶ τότε ἐξ ἑνὸς ἐγεννήθησαν—οὐ γὰρ δὴ πῦρ γε καὶ γῆ καὶ ὕδωρ ὄντα ἓν ἦν τὸ πᾶν. ἄδηλον δὲ καὶ πότερον ἀρχὴν αὐτῷ θετέον τὸ ἓν ἢ τὰ πολλά, λέγω δὲ πῦρ καὶ γῆν καὶ τὰ σύστοιχα τούτων. ᾗ μὲν γὰρ ὡς ὕλη ὑπόκειται, ἐξ οὗ μεταβάλλοντα διὰ τὴν κίνησιν γίνονται γῆ καὶ πῦρ, τὸ

b 22 δνοφόεντά FJ et, ut videtur, E^1: ζοφόεντά HL : γνοφόεντά E^2 ἐπὶ E^1 (ut videtur) et L : περὶ E^2FHJ 23 γενέσθαι E^1L 26 ἀλλοίωσιν E, sed correxit ᾗ] ἢ EHLΦ^1 ἀεὶ . . . ὑποθετέον] ὑποθετέον εἶναι τοῖς ἐναντίοις H : ἀεὶ ἐντίοις ὑποθετέον E 27–28 ἄν τε κατ' αὔξησιν καὶ φθίσιν om. E a 1 μία ἡ πάντων FL 4 ἑαυτὸν F αὐτὸς om. E 12 γιγνόμεναί E ὡς om. E ἀναγκαῖον H 16 προσγενέσθαι J 18 γε om. FΦ^1 19 ὕδωρ ἔτι ὄντα Bekker : ἔτι om. codd. omnes, Φ^1 et Γ. Infra lin. (sub ὕδωρ) incerta quaedam habet H 20 αὐτῶν HL : αὐτὰ fecit F τὰ πολλὰ ἢ τὸ ἕν F καὶ om. F 22 γίνεται F πῦρ καὶ γῆ FL : γῆ καὶ τὸ ὕδωρ E : ignis et terra et aqua Γ

ἓν στοιχεῖον· ᾗ δὲ τοῦτο μὲν ἐκ συνθέσεως γίγνεται συνιόντων ἐκείνων, ἐκεῖνα δ' ἐκ διαλύσεως, στοιχειωδέστερα ἐκεῖνα καὶ πρότερα τὴν φύσιν.

Ὅλως τε δὴ περὶ γενέσεως καὶ φθορᾶς τῆς ἁπλῆς 2 λεκτέον, πότερον ἔστιν ἢ οὐκ ἔστι καὶ πῶς ἔστιν, καὶ † περὶ τὰς ἄλλας κινήσεις†, οἷον περὶ αὐξήσεως καὶ ἀλλοιώσεως. Πλάτων μὲν οὖν μόνον περὶ γενέσεως ἐσκέψατο καὶ φθορᾶς, ὅπως ὑπάρχει τοῖς πράγμασι, καὶ περὶ γενέσεως οὐ πάσης ἀλλὰ τῆς τῶν στοιχείων, πῶς δὲ σάρκες ἢ ὀστᾶ ἢ τῶν ἄλλων τι τῶν τοιούτων, οὐδέν· ἔτι οὐδὲ περὶ ἀλλοιώσεως οὐδὲ περὶ αὐξήσεως, τίνα τρόπον ὑπάρχουσι τοῖς πράγμασιν. ὅλως δὲ παρὰ τὰ ἐπιπολῆς περὶ οὐδενὸς οὐδεὶς ἐπέστησεν ἔξω Δημοκρίτου· οὗτος δ' ἔοικε μὲν περὶ ἁπάντων φροντίσαι, ἤδη 315[b] δὲ ἐν τῷ πῶς διαφέρειν. οὔτε γὰρ περὶ αὐξήσεως οὐδεὶς οὐδὲν διώρισεν, ὥσπερ λέγομεν, ὅ τι μὴ κἂν ὁ τυχὼν εἴπειεν, ὅτι προσιόντος αὐξάνονται τῷ ὁμοίῳ (πῶς δὲ τοῦτο, οὐκέτι), οὐδὲ περὶ μίξεως, οὐδὲ περὶ τῶν ἄλλων ὡς εἰπεῖν οὐδενός, οἷον τοῦ ποιεῖν ἢ τοῦ πάσχειν, τίνα τρόπον τὸ μὲν ποιεῖ τὸ δὲ πάσχει τὰς φυσικὰς ποιήσεις. Δημόκριτος δὲ καὶ Λεύκιππος ποιήσαντες τὰ σχήματα τὴν ἀλλοίωσιν καὶ τὴν γένεσιν ἐκ τούτων ποιοῦσι, διακρίσει μὲν καὶ συγκρίσει γένεσιν καὶ φθοράν, τάξει δὲ καὶ θέσει ἀλλοίωσιν. ἐπεὶ δ' ᾤοντο τὰληθὲς ἐν τῷ φαίνεσθαι, ἐναντία δὲ καὶ ἄπειρα τὰ φαινόμενα, τὰ σχήματα ἄπειρα ἐποίησαν, ὥστε ταῖς μεταβολαῖς τοῦ συγκειμένου τὸ αὐτὸ ἐναντίον δοκεῖν ἄλλῳ καὶ ἄλλῳ, καὶ μετακινεῖσθαι μικροῦ ἐμμιγνυμένου καὶ ὅλως ἕτερον φαίνεσθαι ἐνὸς μετακινηθέντος—ἐκ τῶν αὐτῶν γὰρ τραγῳδία καὶ κωμῳδία γίνεται γραμμάτων. ἐπεὶ δὲ δοκεῖ σχεδὸν

a 23 γίγνονται E 24 στοιχειωδέστερα τὰ τέτταρα ἐκεῖνα F 27–28 τὰς ἄλλας κινήσεις HJLΦ : post ἄλλας add. ἁπλᾶς E et (supra lin.) F : τῶν ἄλλων κινήσεων D^b : de aliis simplicibus motibus Γ : τῶν ἄλλων ἁπλῶν κινήσεων Bekker : τῆς ἄλλης κινήσεως fort. legendum 28 οἷον supra lin. add. J : οἷον καὶ E 29 μόνον om. FH γενέσεως καὶ φθορᾶς ἐσκέψατο L 30 πῶς HJ 31 τῶν πάντων στοιχείων F 32 οὐδέν] οὐδαμῶς H οὐδὲ om. E : οὔτε δὲ F : οὔτε L περὶ αὐξήσεως οὔτε ἀλλοιώσεως E, sed οὔτε ex οὐδὲ fecit 33 οὔτε FL ὑπάρξουσι E^1 35 δ' ἔοικε] δὲ δοκεῖ H b 1 διαφέρει FHL οὐδὲν] οὐδὲ H 2 διώρικεν E 5 ἢ] καὶ E τοῦ om. F 12 δοκεῖ E καὶ ἄλλῳ om. L 13 ἐγγινομένου F 14 κωμῳδία καὶ τραγῳδία F 15 γίνεται καὶ κωμῳδία HJ ἐπεὶ δὲ] ἔτι E πᾶσι σχεδὸν FL$Φ^1$

πᾶσιν ἕτερον εἶναι γένεσις καὶ ἀλλοίωσις, καὶ γίνεσθαι μὲν καὶ φθείρεσθαι συγκρινόμενα καὶ διακρινόμενα, ἀλλοιοῦσθαι δὲ μεταβαλλόντων τῶν παθημάτων, περὶ τούτων ἐπιστήσασι θεωρητέον. ἀπορίας γὰρ ἔχει ταῦτα καὶ πολλὰς καὶ εὐλόγους. εἰ μὲν γάρ ἐστι σύγκρισις ἡ γένεσις, πολλὰ ἀδύνατα συμβαίνει· εἰσὶ δ' αὖ λόγοι ἕτεροι ἀναγκαστικοὶ καὶ οὐκ εὔποροι διαλύειν ὡς οὐκ ἐνδέχεται ἄλλως ἔχειν· εἴτε μή ἐστι σύγκρισις ἡ γένεσις, ἢ ὅλως οὐκ ἔστι γένεσις ἢ ἀλλοίωσις, ἢ καὶ τοῦτο διαλῦσαι χαλεπὸν ὂν πειρατέον. ἀρχὴ δὲ τούτων πάντων, πότερον οὕτω γίνεται καὶ ἀλλοιοῦται καὶ αὐξάνεται τὰ ὄντα καὶ τἀναντία τούτοις πάσχει, τῶν πρώτων ὑπαρχόντων μεγεθῶν ἀδιαιρέτων, ἢ οὐθέν ἐστι μέγεθος ἀδιαίρετον· διαφέρει γὰρ τοῦτο πλεῖστον. καὶ πάλιν εἰ μεγέθη, πότερον, ὡς Δημόκριτος καὶ Λεύκιππος, σώματα ταῦτ' ἐστίν, ἢ ὥσπερ ἐν τῷ Τιμαίῳ ἐπίπεδα; τοῦτο μὲν οὖν αὐτό, καθάπερ καὶ ἐν ἄλλοις εἰρήκαμεν, ἄλογον μέχρι ἐπιπέδων διαλῦσαι· διὸ μᾶλλον εὔλογον σώματα εἶναι ἀδιαίρετα, ἀλλὰ καὶ ταῦτα πολλὴν ἔχει ἀλογίαν. ὅμως δὲ τούτοις ἀλλοίωσιν καὶ γένεσιν ἐνδέχεται ποιεῖν, καθάπερ εἴρηται, τροπῇ καὶ διαθιγῇ μετακινοῦντα τὸ αὐτὸ καὶ ταῖς τῶν σχημάτων διαφοραῖς, ὅπερ ποιεῖ Δημόκριτος (διὸ καὶ χροιὰν οὔ φησιν εἶναι—τροπῇ γὰρ χρωματίζεσθαι), τοῖς δ' εἰς ἐπίπεδα διαιροῦσιν οὐκέτι· οὐδὲν γὰρ γίνεται πλὴν στερεὰ συντιθεμένων, πάθος γὰρ οὐδ' ἐγχειροῦσι γεννᾶν οὐδὲν ἐξ αὐτῶν. αἴτιον δὲ τοῦ ἐπ' ἔλαττον δύνασθαι τὰ ὁμολογούμενα συνορᾶν ἡ ἀπειρία· διὸ ὅσοι ἐνῳκήκασι μᾶλλον ἐν τοῖς φυσικοῖς, μᾶλλον δύνανται ὑποτίθεσθαι τοιαύτας ἀρχὰς αἳ ἐπὶ πολὺ δύνανται συνείρειν, οἱ δ' ἐκ τῶν πολλῶν λόγων ἀθεώρητοι

b 16 *γένεσιν καὶ ἀλλοίωσιν* F *καὶ γίνεσθαι μὲν*] *γίνεσθαι μὲν γὰρ* FHJ 18 *ἐπιστῆσαι* J 19 *γὰρ* om. J 21 *δ' αὖ*] *δ' οὖν* J *ἕτεροι λόγοι* HJ *καὶ οὐκ εὔποροι διαλύειν* post 22 *ἔχειν* H 23 *ἔστι*] *ἔσται* J *ἢ* sec.] *καὶ* E 24 *ἢ*] *ἢ εἰ* FLΓ *ὂν* om. EΓ : *ὃ* H 25 *ἁπάντων* FL *οὕτω*] *ἆρα* H 29 *πότερον*] *πρότερον* E *ταῦτ' ἐστίν* om. H 30 *αὐτό* om. L 31 *καὶ* om. F *ἄλογον*] *ἄτοπον* F 33 *ὅμως*] *ὁμοίως* EJ *τοίτων* F : et ex his Γ 34 *καθάπερ εἴρηται* om. EL 35 *διαθηγῇ* EJLΦ^{c}. Cf. etiam infra 327ª 18 *μ. τὸ αὐτὸ*] transmutante idolum Γ a 1 *χροιὴν* HJ, sed vide Diels, Vorsokratiker, p. 715 2 *φασιν* F 3 *συντιθεμένων κατὰ πλάτος* L, et in marg. F 4 *ἐγχωροῦσι* L 6 *συνῳκήκασι* L 7 *τὰς τοιαύτας* F *αἳ* om. E^{1} : *αἷς* E^{2}F : utramque lectionem agnovit Φ *ἐπὶ* om. F 8 *δύναται* J *λόγων πολλῶν* J *πολλῶν* om. Φ^{1} : *ἄλλων* H

τῶν ὑπαρχόντων ὄντες, πρὸς ὀλίγα βλέψαντες, ἀποφαίνονται ῥᾷον. ἴδοι δ' ἄν τις καὶ ἐκ τούτων ὅσον διαφέρουσιν οἱ φυσικῶς καὶ λογικῶς σκοποῦντες· περὶ γὰρ τοῦ ἄτομα εἶναι μεγέθη οἱ μέν φασιν ὅτι αὐτὸ τὸ τρίγωνον πολλὰ ἔσται, Δημόκριτος δ' ἂν φανείη οἰκείοις καὶ φυσικοῖς λόγοις πεπεῖσθαι. δῆλον δ' ἔσται ὃ λέγομεν προϊοῦσιν. ἔχει γὰρ ἀπορίαν, εἴ τις θείη σῶμά τι εἶναι καὶ μέγεθος πάντῃ διαιρετόν, καὶ τοῦτο δυνατόν. τί γὰρ ἔσται ὅπερ τὴν διαίρεσιν διαφεύγει; εἰ γὰρ πάντῃ διαιρετόν, καὶ τοῦτο δυνατόν, κἂν ἅμα εἴη τοῦτο διῃρημένον, καὶ εἰ μὴ ἅμα διῄρηται· κἂν εἰ τοῦτο γένοιτο, οὐδὲν ἂν εἴη ἀδύνατον. οὐκοῦν καὶ κατὰ τὸ μέσον ὡσαύτως, καὶ ὅλως δέ, εἰ πάντῃ πέφυκε διαιρετόν, ἂν διαιρεθῇ, οὐδὲν ἔσται ἀδύνατον γεγονός, ἐπεὶ οὐδ' ἂν εἰς μυρία μυριάκις διῃρημένα ⟨διαιρεθ⟩ῇ, οὐδὲν ἀδύνατον· καίτοι ἴσως οὐδεὶς ἂν διέλοι. ἐπεὶ τοίνυν πάντῃ τοιοῦτόν ἐστι τὸ σῶμα, διῃρήσθω. τί οὖν ἔσται λοιπόν; μέγεθος; οὐ γὰρ οἷόν τε· ἔσται γάρ τι οὐ διῃρημένον, ἣν δὲ πάντῃ διαιρετόν. ἀλλὰ μὴν εἰ μηδὲν ἔσται σῶμα μηδὲ μέγεθος, διαίρεσις δ' ἔσται, ἢ ἐκ στιγμῶν ἔσται, καὶ ἀμεγέθη ἐξ ὧν σύγκειται, ἢ οὐδὲν παντάπασιν, ὥστε κἂν γίνοιτο ἐκ μηδενὸς κἂν εἴη συγκείμενον, καὶ τὸ πᾶν δὴ οὐδὲν ἀλλ' ἢ φαινόμενον. ὁμοίως δὲ κἂν ᾖ ἐκ στιγμῶν, οὐκ ἔσται ποσόν. ὁπότε γὰρ ἥπτοντο καὶ ἦν μέγεθος καὶ ἅμα ἦσαν, οὐδὲν ἐποίουν μεῖζον τὸ πᾶν· διαιρεθέντος γὰρ εἰς δύο καὶ πλείω, οὐδὲν ἔλαττον οὐδὲ μεῖζον τὸ πᾶν τοῦ πρότερον· ὥστε κἂν πᾶσαι συντεθῶσιν, οὐδὲν ποιήσουσι μέγεθος. ἀλλὰ μὴν καὶ εἴ τι διαιρουμένου οἷον ἔκπρισμα
316b γίνεται τοῦ σώματος, καὶ οὕτως ἐκ τοῦ μεγέθους σῶμά τι

a 9 ἀποφαίνονται] ἀπεκρίναντο L 10 ὅσων E : ὅσῳ L 11 εἶναι τὰ μεγέθη E 12 φασιν] οὐ φασὶ J ὅτι] διότι FHJLΦ¹Γ αὐτὸ τὸ τρ.] τὸ αὐτοτρίγωνον FHLΦ 13 οἰκείως L : ἐκλο vel ἐκλογ H 14 γὰρ] δὲ HJ 15 θείη] φήσει E : θήσει Φ¹ 16 καὶ τοῦτο δυνατόν om. E ὅπερ] παρὰ E διαφεύγειν E 17 κἂν] καὶ E 18 τοῦτο om. Φ¹ τοῦτο πάντῃ διῃρημένον F ἅμα τοῦτο διῄρηται F 19 εἰ om. H γένηται FH 20 τὸ om. E, et Φ (exceptis codd. GT) 21 ἂν prius] ἐὰν Φᶜ : κἂν FL διαιρεθείη F εἰς om. EF¹ : εἰ J 22 μυρία om. EJ, et erasit F² suprascr. εἰς διῃρημένα ⟨δ αιρεθ⟩ῇ scripsi : διῃρημένα ᾖ EHJL : εἴη διῃρημένα εἴη F (priore tamen εἴη eraso, et secundo εἴη rc. manu addito) 29 ᾖ om. HJ ᾖ] εἰ HL 30 ἔστι L ἦν ἐν μέγεθος J : ἐν μεγέθει (omisso ἦν) H 32 ἢ καὶ Φ¹ πλείους EF 33 προτέρου F ποιοῦσι F b 1 τοῦ post ἐκ om. F

ἀπέρχεται, ὁ αὐτὸς λόγος· ἐκεῖνο γὰρ πῶς διαιρετόν; εἰ δὲ μὴ σῶμα ἀλλ' εἶδός τι χωριστὸν ἢ πάθος ἀπῆλθεν, καὶ ἔστι τὸ μέγεθος στιγμαὶ ἢ ἁφαὶ τοδὶ παθοῦσαι, ἄτοπον ἐκ μὴ μεγεθῶν μέγεθος εἶναι. ἔτι δὲ ποῦ ἔσονται, καὶ ἀκίνητοι ἢ κινούμεναι αἱ στιγμαί; ἁφή τε ἀεὶ μία δυοῖν τινῶν, ὡς ὄντος τινὸς παρὰ τὴν ἁφὴν καὶ τὴν διαίρεσιν καὶ τὴν στιγμήν. εἰ δή τις θήσεται ὁτιοῦν ἢ ὁπηλικονοῦν σῶμα εἶναι πάντῃ διαιρετόν, ταῦτα συμβαίνει. ἔτι ἐὰν διελὼν συνθῶ τὸ ξύλον ἤ τι ἄλλο, πάλιν ἴσον τε καὶ ἕν. οὐκοῦν οὕτως ἔχει δηλονότι κἂν τέμω τὸ ξύλον καθ' ὁτιοῦν σημεῖον· πάντῃ ἄρα διῄρηται δυνάμει. τί οὖν ἔστι παρὰ τὴν διαίρεσιν; εἰ γὰρ καὶ ἔστι τι πάθος, ἀλλὰ πῶς εἰς ταῦτα διαλύεται καὶ γίνεται ἐκ τούτων; ἢ πῶς χωρίζεται ταῦτα; ὥστ' εἴπερ ἀδύνατον ἐξ ἀφῶν ἢ στιγμῶν εἶναι τὰ μεγέθη, ἀνάγκη εἶναι σώματα ἀδιαίρετα καὶ μεγέθη. οὐ μὴν ἀλλὰ καὶ ταῦτα θεμένοις οὐχ ἧττον συμβαίνει ἀδύνατα· ἔσκεπται δὲ περὶ αὐτῶν ἐν ἑτέροις. ἀλλὰ ταῦτα πειρατέον λύειν, διὸ πάλιν ἐξ ἀρχῆς τὴν ἀπορίαν λεκτέον. τὸ μὲν οὖν ἅπαν σῶμα αἰσθητὸν εἶναι διαιρετὸν καθ' ὁτιοῦν σημεῖον καὶ ἀδιαίρετον οὐδὲν ἄτοπον· τὸ μὲν γὰρ δυνάμει, τὸ δ' ἐντελεχείᾳ ὑπάρξει. τὸ δ' εἶναι ἅμα πάντῃ διαιρετὸν δυνάμει ἀδύνατον δόξειεν ἂν εἶναι. εἰ γὰρ δυνατόν, κἂν γένοιτο (οὐχ ὥστε ἅμα εἶναι ἄμφω ἐντελεχείᾳ, ἀδιαίρετον καὶ διῃρημένον, ἀλλὰ διῃρημένον καθ' ὁτιοῦν σημεῖον)· οὐδὲν ἄρα ἔσται λοιπόν, καὶ εἰς ἀσώματον ἐφθαρμένον τὸ σῶμα, καὶ γίγνοιτο δ' ἂν πάλιν ἤτοι ἐκ στιγμῶν ἢ ὅλως ἐξ οὐδενός. καὶ τοῦτο πῶς δυνατόν; ἀλλὰ μὴν ὅτι γε διαιρεῖται εἰς χωριστὰ καὶ ἀεὶ εἰς ἐλάττω μεγέθη καὶ εἰς ἀπέχοντα καὶ κεχωρισμένα, φανερόν. οὔτε δὴ κατὰ μέρος διαιροῦντι εἴη ἂν ἄπειρος ἡ θρύψις, οὔτε ἅμα

b 2 γὰρ om. EHJL 3 οὐ χωριστὸν et χωριστὸν agn. Φ: οὐ supra lin. add. J² post πάθος add. ὃ H et in marg. FJ² 4 στιγμαὶ ὂν ἢ J post ἄτοπον add. μὲν τὸ HJ ἐκ μὴ] μὴ ἐκ H 6 τινοῖν F: τινον, suprascr. οιν, J 8 ὁτιοῦν θήσεται FL ἢ om. EL ὁπηλίκον E 9 πάντα ταῦτα L ἐὰν] ἂν E συνθῶ fecit E 10 ἤ] εἰ J 11 κἂν τέμω om. E 13 ἔσται H 15 ἀφῶν ἢ om. F 16 οὐ μὴν ἀλλὰ] ἀλλὰ μὴν FHJLΦ¹ θεμένοις οὐχ ἧττον om. E 17 ἀδύνατον FL 19 λεκτέον τὴν ἀπορίαν H 21 post δυνάμει add. διαιρετόν EL 22 δυνάμει fort. eiiciendum 23 εἶναι ἅμα F 24 ἐντελεχείᾳ ἅμφω FL 25 δυνάμει καθ' F¹ 26 γίγνοιτο EFJL: γίνοιτο H: γένοιτο Bekker 27 ἐκ τῶν στιγμῶν E 28 διαιρεῖται ἀεὶ εἰς H

οἷόν τε διαιρεθῆναι κατὰ πᾶν σημεῖον (οὐ γὰρ δυνατόν), ἀλλὰ μέχρι του· ἀνάγκη ἄρα ἄτομα ἐνυπάρχειν μεγέθη ἀόρατα, ἄλλως τε καὶ εἴπερ ἔσται γένεσις καὶ φθορὰ ἡ μὲν διακρίσει ἡ δὲ συγκρίσει. ὁ μὲν οὖν ἀναγκάζειν δοκῶν
317ª λόγος εἶναι μεγέθη ἄτομα οὗτός ἐστιν· ὅτι δὲ λανθάνει παραλογιζόμενος, καὶ ᾗ λανθάνει, λέγωμεν. ἐπεὶ γὰρ οὐκ ἔστι στιγμὴ στιγμῆς ἐχομένη, τὸ πάντῃ εἶναι διαιρετὸν ἔστι μὲν ὡς ὑπάρχει τοῖς μεγέθεσιν, ἔστι δ' ὡς οὔ. δοκεῖ δ', ὅταν τοῦτο
5 τεθῇ, καὶ ὁπῃοῦν καὶ πάντῃ στιγμὴν εἶναι, ὥστ' ἀναγκαῖον εἶναι διαιρεθῆναι τὸ μέγεθος εἰς μηδέν—πάντῃ γὰρ εἶναι στιγμήν, ὥστε ἢ ἐξ ἀφῶν ἢ ἐκ στιγμῶν εἶναι. τὸ δ' ἔστιν ὡς ὑπάρχει πάντῃ, ὅτι μία ὁπῃοῦν ἐστι καὶ πᾶσαι ὡς ἑκάστη· πλείους δὲ μιᾶς οὐκ εἰσίν (ἐφεξῆς γὰρ οὐκ εἰσίν), ὥστ' οὐ πάντῃ.
10 εἰ γὰρ κατὰ μέσον διαιρετόν, καὶ κατ' ἐχομένην στιγμὴν ἔσται διαιρετόν· ⟨οὐκ ἔστι δέ,⟩ οὐ γάρ ἐστιν ἐχόμενον σημεῖον σημείου ἡ στιγμὴ στιγμῆς, τοῦτο δ' ἐστὶ διαίρεσις ἡ σύνθεσις. ὥστ' ἔστι καὶ σύγκρισις καὶ διάκρισις, ἀλλ' οὔτ' εἰς ἄτομα καὶ ἐξ ἀτόμων (πολλὰ γὰρ τὰ ἀδύνατα) οὔτε οὕτως ὥστε πάντῃ
15 διαίρεσιν γενέσθαι (εἰ γὰρ ἦν ἐχομένη στιγμὴ στιγμῆς, τοῦτ' ἂν ἦν), ἀλλ' εἰς μικρὰ καὶ ἐλάττω ἐστί, καὶ σύγκρισις ἐξ ἐλαττόνων. ἀλλ' οὐχ ἡ ἁπλῆ καὶ τελεία γένεσις συγκρίσει καὶ διακρίσει ὥρισται, ὥς τινές φασιν, τὴν δ' ἐν τῷ συνεχεῖ μεταβολὴν ἀλλοίωσιν, ἀλλὰ τοῦτ' ἐστὶν ἐν ᾧ
20 σφάλλεται πάντα· ἔστι γὰρ γένεσις ἁπλῆ καὶ φθορὰ οὐ συγκρίσει καὶ διακρίσει, ἀλλ' ὅταν μεταβάλλῃ ἐκ τοῦδε εἰς τόδε ὅλον. οἱ δὲ οἴονται ἀλλοίωσιν εἶναι πᾶσαν τὴν τοιαύτην μεταβολήν· τὸ δὲ διαφέρει. ἐν γὰρ τῷ ὑποκειμένῳ τὸ μέν ἐστι κατὰ τὸν λόγον, τὸ δὲ κατὰ τὴν ὕλην·

b 31 οἷόν τε] οἷονται J οὐ γὰρ] οὐκ ἄρα E 32 ἐννυπ. μεγέθη] μεγέθη ὑπάρχειν $\Phi^c\Gamma$ 33 ατα . . . 34 συγ in litura rc. manu E 34 ἀναγκάζων F δοκῶν om. F, post λόγος ponit $H\Phi^1$ a 3 μὲν om. EJ 5 καὶ πάντῃ . . . 8 ὁπῃοῦν om. L 5 στιγμὴ J, et (ut videtur) F 6 εἶναι prius om. F 8 ὑπάρχῃ E 10 μέσων H κατ' ἐχομένην fecit E 11 διαιρετόν· οὐκ ἔστι δέ, οὐ γάρ e coni. T. W. Allen scripsi : διαιρετόν· οὐχὶ δέ· οὐ γάρ J : non autem possibile Γ (unde ἀλλ' ἀδύνατον conieceris) : διαιρετόν· οὐ γάρ EFHLΦ^c ἡ στιγμὴ στιγμῆς om. Φ^c 12 τοῦτο] τὸ E ἢ] καὶ H 13 διάκρισις καὶ σύγκρισις EL 14 ἀδύνατα] ἄτοπα H ὥστε fecit E 15 γείνεσθαι E : γίγνεσθαι L 16 ἂν om. E 17 ἐξ] καὶ ἐξ H τελέα J 21 μεταβάλῃ ἐκ τοιοῦδε EL 22 τόδε] τὸν τοιόνδε E πᾶσαν εἶναι EL 24 τὰ μέν H ἐστι τόδε κατὰ E

ὅταν μὲν οὖν ἐν τούτοις ᾖ ἡ μεταβολή, γένεσις ἔσται ἢ φθορά, ὅταν δ' ἐν τοῖς πάθεσι καὶ κατὰ συμβεβηκός, ἀλλοίωσις. διακρινόμενα δὲ καὶ συγκρινόμενα εὔφθαρτα γίνεται—ἐὰν μὲν γὰρ εἰς ἐλάττω ὑδάτια διαιρεθῇ, θᾶττον ἀὴρ γίνεται, ἐὰν δὲ συγκριθῇ, βραδύτερον. μᾶλλον δ' ἔσται δῆλον ἐν τοῖς ὕστερον· νῦν δὲ τοσοῦτον διωρίσθω, ὅτι ἀδύνατον εἶναι τὴν γένεσιν σύγκρισιν, οἷαν δή τινές φασιν.

3 Διωρισμένων δὲ τούτων, πρῶτον θεωρητέον πότερον ἔστι τι γινόμενον ἁπλῶς καὶ φθειρόμενον, ἢ κυρίως μὲν οὐδέν, ἀεὶ δ' ἔκ τινος καὶ τί, λέγω δ' οἷον ἐκ κάμνοντος ὑγιαῖνον καὶ κάμνον ἐξ ὑγιαίνοντος, ἢ μικρὸν ἐκ μεγάλου καὶ μέγα ἐκ μικροῦ, καὶ τἆλλα πάντα τοῦτον τὸν τρόπον. εἰ γὰρ ἁπλῶς ἔσται γένεσις, ἁπλῶς ἄν τι γίνοιτο ἐκ μὴ ὄντος, ὥστ' ἀληθὲς ἂν εἴη λέγειν ὅτι ὑπάρχει τισὶ τὸ μὴ ὄν· τὶς μὲν γὰρ γένεσις ἐκ μὴ ὄντος τινός, οἷον ἐκ μὴ λευκοῦ ἢ μὴ καλοῦ, ἡ δὲ ἁπλῆ ἐξ ἁπλῶς μὴ ὄντος. τὸ δ' ἁπλῶς ἤτοι τὸ πρῶτον σημαίνει καθ' ἑκάστην κατηγορίαν τοῦ ὄντος, ἢ τὸ καθόλου καὶ τὸ πάντα περιέχον. εἰ μὲν οὖν τὸ πρῶτον, οὐσίας ἔσται γένεσις ἐκ μὴ οὐσίας· ᾧ δὲ μὴ ὑπάρχει οὐσία μηδὲ τὸ τόδε, δῆλον ὡς οὐδὲ τῶν ἄλλων οὐδεμία κατηγοριῶν, οἷον οὔτε ποιὸν οὔτε ποσὸν οὔτε τὸ ποῦ (χωριστὰ γὰρ ἂν εἴη τὰ πάθη τῶν οὐσιῶν)· εἰ δὲ τὸ μὴ ὂν ὅλως, ἀπόφασις ἔσται καθόλου πάντων, ὥστε ἐκ μηδενὸς ἀνάγκη γίνεσθαι τὸ γινόμενον. περὶ μὲν οὖν τούτων ἐν ἄλλοις τε διηπόρηται καὶ διώρισται τοῖς λόγοις ἐπὶ πλεῖον, συντόμως δὲ καὶ νῦν λεκτέον, ὅτι τρόπον μέν τινα ἐκ μὴ ὄντος ἁπλῶς γίνεται, τρόπον δὲ ἄλλον ἐξ ὄντος ἀεί· τὸ γὰρ δυνάμει ὂν ἐντελεχείᾳ δὲ μὴ ὂν ἀνάγκη προϋπάρχειν λεγόμενον ἀμφοτέρως. ὃ δὲ καὶ τούτων διωρισμένων ἔχει θαυμαστὴν ἀπο-

a 25 μὲν om. L οὖν om. F τούτοις] τοις E ἔσται] ἐστιν EL 27 συγκρ. δὲ καὶ διακρ. Φ^1 28 μὲν om. EJ γὰρ om. F ὕδατα L, et fort. E^1 29 ἐὰν δὲ] καὶ ἐὰν E 30 τοῖς εἰς ὕστερον F διορίσθω F 31 τὴν γένεσιν εἶναι EΦ^1 δὴ om. HJ 33 τι] τὸ L 34 οἷον om. E ὑγιαίνοντος E 35 καὶ κάμνον] ἢ κάμνον FHJ
b 2 τι om. HJ 3 τισὶ om. HJ 4 μὴ ἐκ λευκοῦ E ἢ] ἢ ἐκ FJ 6 σημαίνει] συμβαίνει L 7 τὸ post καὶ om. F 8 ὑπάρχει (sed ει in litura) J 9 τὸ om. EFL; sed cf. v. 21 κατηγοριῶν] κατηγορία F 10 τὸ ποῦ] τόπος J: locus Γ: τόποι supra lin. adnotavit F 13 οὖν om. L 17 ὑπάρχειν F^1 18 λεγομένων, superposito διωρισμένων, F θαυμαστὴν ἔχει τὴν ἀπορίαν Φ^1

ρίαν, πάλιν ἐπαναποδιστέον, πῶς ἔστιν ἁπλῆ γένεσις, εἴτ'
20 ἐκ δυνάμει ὄντος οὖσα εἴτε καί πως ἄλλως. ἀπορήσειε γὰρ
ἄν τις ἆρ' ἔστιν οὐσίας γένεσις καὶ τοῦ τοῦδε, ἀλλὰ μὴ τοῦ
τοιοῦδε καὶ τοσοῦδε καὶ ποῦ (τὸν αὐτὸν δὲ τρόπον καὶ περὶ
φθορᾶς). εἰ γάρ τι γίνεται, δῆλον ὡς ἔσται δυνάμει τις
οὐσία, ἐντελεχείᾳ δ' οὔ, ἐξ ἧς ἡ γένεσις ἔσται καὶ εἰς ἣν
25 ἀνάγκη μεταβάλλειν τὸ φθειρόμενον· πότερον οὖν ὑπάρξει τι
τούτῳ τῶν ἄλλων ἐντελεχείᾳ; λέγω δ' οἷον ἆρ' ἔσται ποσὸν
ἢ ποιὸν ἢ ποῦ τὸ δυνάμει μόνον τόδε καὶ ὄν, ἁπλῶς δὲ μὴ
τόδε μηδ' ὄν; εἰ γὰρ μηδὲν ἀλλὰ πάντα δυνάμει, χωρι-
στόν τε συμβαίνει τὸ μὴ οὕτως ὂν καὶ ἔτι, ὃ μάλιστα φο-
30 βούμενοι διετέλεσαν οἱ πρῶτοι φιλοσοφήσαντες, τὸ ἐκ μη-
δενὸς γίνεσθαι προϋπάρχοντος· εἰ δὲ τὸ μὲν εἶναι τόδε τι
ἢ οὐσίαν οὐχ ὑπάρξει, τῶν δ' ἄλλων τι τῶν εἰρημένων,
ἔσται, καθάπερ εἴπομεν, χωριστὰ τὰ πάθη τῶν οὐσιῶν. περί
τε τούτων οὖν ὅσον ἐνδέχεται πραγματευτέον, καὶ τίς αἰτία
35 τοῦ γένεσιν ἀεὶ εἶναι, καὶ τὴν ἁπλῆν καὶ τὴν κατὰ μέρος.
318a οὐσης δ' αἰτίας μιᾶς μὲν ὅθεν τὴν ἀρχὴν εἶναί φαμεν τῆς
κινήσεως, μιᾶς δὲ τῆς ὕλης, τὴν τοιαύτην αἰτίαν λεκτέον.
περὶ μὲν γὰρ ἐκείνης εἴρηται πρότερον ἐν τοῖς περὶ κινήσεως
λόγοις, ὅτι ἐστὶ τὸ μὲν ἀκίνητον τὸν ἅπαντα χρόνον, τὸ δὲ
5 κινούμενον ἀεί· τούτων δὲ περὶ μὲν τῆς ἀκινήτου ἀρχῆς τῆς
ἑτέρας καὶ προτέρας διελεῖν ἐστι φιλοσοφίας ἔργον, περὶ δὲ
τοῦ διὰ τὸ συνεχῶς κινεῖσθαι τἆλλα κινοῦντος ὕστερον ἀπο-
δοτέον, τί τοιοῦτον τῶν καθ' ἕκαστα λεγομένων αἴτιόν ἐστιν.
νῦν δὲ τὴν ὡς ἐν ὕλης εἴδει τιθεμένην αἰτίαν εἴπωμεν, δι' ἣν
10 ἀεὶ φθορὰ καὶ γένεσις οὐχ ὑπολείπει τὴν φύσιν—ἅμα γὰρ

b 20 οὖσα] οὐσία H : οὐσίας L 21 τοῦ post μὴ om. L 22 τοιοῦδε] τοιοῖτουδε E καὶ τοῦ τοσοῦδε F καὶ τοῦ ποῦ FJ δὲ] δὴ FHL 23 εἰ om. E τι] fort. legendum τόδε τι 24 οὐσία] οὖσα J ἐξ . . . ἔσται om. E ἔσται om. J ἣν om. E 25 τὸ] τὸν E 26 τούτῳ] τοῦτο F λέγω om. E οἷον om. H ποιὸν ἢ ποσὸν J 27 τὸ] τῷ H μόνον] ὂν FL δὲ] τε E 29 τε] τι E μὴ οὕτως ELΦ^{c} : οὕτω μὴ H : οὕτως μὴ FJ : quod sit (*l.* sic) non ens Γ ἔτι om. E 31 γίνεσθαι om. E τι ἢ] τὴν J 32 οὐσία EF, sed οὐσίαν fecit E ὑπάρχει FL 33 χοριστὰ J 34 πραγματέον L 35 εἶναι post ἁπλῆν EL a 1 τῆς κινήσεως εἶναί φαμεν F 4 ὅτι δε ἐστὶν E^{1} πάντα E δὲ om. E, add. supra lin. J 5 τῆς ἀκινήτου om. (ut videtur), et ἀρχῆς post ἑτέρας ponit E^{1} τῆς ante ἑτέρας om. FJ 6 ἑτέρας καὶ om. L 8 τοιούτων L τῶν om. J

ἂν ἴσως τοῦτο γένοιτο δῆλον, καὶ περὶ τοῦ νῦν ἀπορηθέντος πῶς ποτε δεῖ λέγειν καὶ περὶ τῆς ἁπλῆς φθορᾶς καὶ γενέσεως. ἔχει δ' ἀπορίαν ἱκανὴν καὶ τί τὸ αἴτιον τοῦ συνείρειν τὴν γένεσιν, εἴπερ τὸ φθειρόμενον εἰς τὸ μὴ ὂν ἀπέρχεται, τὸ δὲ μὴ ὂν μηδέν ἐστιν (οὔτε γὰρ τί οὔτε ποιὸν οὔτε ποσὸν οὔτε ποῦ τὸ μὴ ὄν)· εἴπερ οὖν ἀεί τι τῶν ὄντων ἀπέρχεται, διὰ τί ποτ' οὐκ ἀνήλωται πάλαι καὶ φροῦδον τὸ πᾶν, εἴ γε πεπερασμένον ἦν ἐξ οἵ γίνεται τῶν γινομένων ἕκαστον; οὐ γὰρ δὴ διὰ τὸ ἄπειρον εἶναι ἐξ οὗ γίνεται, οὐχ ὑπολείπει· τοῦτο γὰρ ἀδύνατον, κατ' ἐνέργειαν μὲν γὰρ οὐδέν ἐστιν ἄπειρον, δυνάμει δ' ἐπὶ τὴν διαίρεσιν, ὥστ' ἔδει ταύτην εἶναι μόνην τὴν μὴ ὑπολείπουσαν τῷ γίνεσθαί τι ἀεὶ ἔλαττον—νῦν δὲ τοῦτο οὐχ ὁρῶμεν. ἆρ' οὖν διὰ τὸ τὴν τοῦδε φθορὰν ἄλλου εἶναι γένεσιν καὶ τὴν τοῦδε γένεσιν ἄλλου εἶναι φθορὰν ἄπαυστον ἀναγκαῖον εἶναι τὴν μεταβολήν; περὶ μὲν οὖν τοῦ γένεσιν εἶναι καὶ φθορὰν ὁμοίως περὶ ἕκαστον τῶν ὄντων, ταύτην οἰητέον εἶναι πᾶσιν ἱκανὴν αἰτίαν, διὰ τί δέ ποτε τὰ μὲν ἁπλῶς γίνεσθαι λέγεται καὶ φθείρεσθαι τὰ δ' οὐχ ἁπλῶς, πάλιν σκεπτέον, εἴπερ τὸ αὐτό ἐστι γένεσις μὲν τουδὶ φθορὰ δὲ τουδί, καὶ φθορὰ μὲν τουδὶ γένεσις δὲ τουδί· ζητεῖ γάρ τινα τοῦτο λόγον. λέγομεν γὰρ ὅτι φθείρεται νῦν ἁπλῶς, καὶ οὐ μόνον τοδί· καὶ αὕτη μὲν γένεσις ἁπλῶς, αὕτη δὲ φθορά. τοδὶ δὲ γίνεται μέν τι, γίνεται δ' ἁπλῶς οὔ· φαμὲν γὰρ τὸν μανθάνοντα γίνεσθαι μὲν ἐπιστήμονα, γίνεσθαι δ' ἁπλῶς οὔ. καθάπερ οὖν πολλάκις διορίζομεν λέγοντες ὅτι τὰ μὲν τόδε τι σημαίνει τὰ δ' οὔ, διὰ τοῦτο συμβαίνει τὸ ζητούμενον. διαφέρει γὰρ εἰς ἃ μεταβάλλει τὸ μεταβάλλον, οἷον ἴσως ἡ μὲν εἰς πῦρ ὁδὸς γένεσις μὲν ἁπλῆ, φθορὰ δέ τινος ἐστιν, οἷον γῆς, ἡ δὲ γῆς γένεσις τὶς γένεσις, γένεσις δ' οὐχ ἁπλῶς, φθορὰ δ'

a 11 γένοιτο τοῦτο F 12 δεῖ om. E καὶ post λέγειν om. J 14 τὴν] ἀεὶ τὴν Φ^1 15 μηδέν] οὐδὲν μή E : οὐδέν L 17 ἀνάλωται HJ πάλαι in marg. add. F 18 ἦν] η E γίνεται τῶν om. E γινόμενον E 22 μόνην εἶναι J 26 ὁμοίως ἀεὶ περὶ F 27 οἰητέον ἱκανὴν πᾶσιν αἰτίαν F 28 λέγεται γίγνεσθαι F καὶ] τὰ δὲ καὶ E : τὰ δὲ Φ^1 29 ἁπλῶν E ἐστι om. L 30 φθορὰ . . . γένεσις δὲ τουδί om. L 32 νῦν] νῦν μὲν Φ^1 35 οὔ. καθάπερ] οὐ γὰρ καθάπερ E διορίζομεν πολλάκις FHL b 3 ἡ om. E 4 ἐστιν om. LΦ^1 5 τὶς . . . φθορὰ] τὶς γένεσις δὲ φθορὰ E^1 : τὶς γένεσις, φθορὰ L : γένεσις τίς, φθορὰ Φ^1

ἁπλῶς, οἷον πυρός—ὥσπερ Παρμενίδης λέγει δύο, τὸ ὂν καὶ τὸ μὴ ὂν εἶναι φάσκων πῦρ καὶ γῆν. τὸ δὴ ταῦτα ἢ τοιαῦθ' ἕτερα ὑποτίθεσθαι διαφέρει οὐδέν· τὸν γὰρ τρόπον ζητοῦμεν, ἀλλ' οὐ τὸ ὑποκείμενον. ἡ μὲν οὖν εἰς τὸ μὴ ὂν ἁπλῶς ὁδὸς φθορὰ ἁπλῆ, ἡ δ' εἰς τὸ ἁπλῶς ὂν γένεσις ἁπλῆ. οἷς οὖν διώρισται, εἴτε πυρὶ καὶ γῇ εἴτε ἄλλοις τισί, τούτων ἔσται τὸ μὲν ὂν τὸ δὲ μὴ ὄν. ἕνα μὲν οὖν τρόπον τοῦτῳ διοίσει τὸ ἁπλῶς γίνεσθαι καὶ φθείρεσθαι τοῦ μὴ ἁπλῶς, ἄλλον δὲ τῇ ὕλῃ ὁποία τις ἂν ᾖ· ἧς μὲν γὰρ μᾶλλον αἱ διαφοραὶ τόδε τι σημαίνουσι, μᾶλλον οὐσία, ἧς δὲ στέρησιν, μὴ ὄν—οἷον εἰ τὸ μὲν θερμὸν κατηγορία τις καὶ εἶδος, ἡ δὲ ψυχρότης στέρησις, διαφέρουσι δὲ γῇ καὶ πῦρ ταύταις ταῖς διαφοραῖς. δοκεῖ δὲ μᾶλλον τοῖς πολλοῖς τῷ αἰσθητῷ καὶ μὴ αἰσθητῷ διαφέρειν· ὅταν μὲν γὰρ εἰς αἰσθητὴν μεταβάλλῃ ὕλην, γίνεσθαί φασιν, ὅταν δ' εἰς ἀφανῆ, φθείρεσθαι. τὸ γὰρ ὂν καὶ τὸ μὴ ὂν τῷ αἰσθάνεσθαι καὶ τῷ μὴ αἰσθάνεσθαι διορίζουσιν, ὥσπερ τὸ μὲν ἐπιστητὸν ὄν, τὸ δ' ἄγνωστον μὴ ὄν (ἡ γὰρ αἴσθησις ἐπιστήμης ἔχει δύναμιν)· καθάπερ οὖν αὐτοὶ τῷ αἰσθάνεσθαι ἢ τῷ δύνασθαι καὶ ζῆν καὶ εἶναι νομίζουσιν, οὕτω καὶ τὰ πράγματα, τρόπον τινὰ διώκοντες τἀληθές, αὐτὸ δὲ λέγοντες οὐκ ἀληθές. συμβαίνει δὴ κατὰ δόξαν καὶ κατ' ἀλήθειαν ἄλλως τὸ γίνεσθαί τε ἁπλῶς καὶ τὸ φθείρεσθαι· πνεῦμα γὰρ καὶ ἀὴρ κατὰ μὲν τὴν αἴσθησιν ἧττόν ἐστιν (διὸ καὶ τὰ φθειρόμενα ἁπλῶς τῇ εἰς ταῦτα μεταβολῇ φθείρεσθαι λέγουσιν, γίνεσθαι δ' ὅταν εἰς ἅπτὸν καὶ εἰς γῆν μεταβάλλῃ), κατὰ δ' ἀλήθειαν μᾶλλον τόδε τι καὶ εἶδος ταῦτα τῆς γῆς. τοῦ μὲν οὖν εἶναι τὴν μὲν ἁπλῆν γένεσιν φθορὰν οὖ-

b 6 ἁπλῶς] ἁπλῆ Φ^1 7 φάσκων εἶναι F τὸ δὴ] δεῖ δὴ J^2: εἰ δὴ vel εἴδη Φ^1 8 ἕτερα ὑποτίθεσθαι om. Φ^1 γὰρ post διαφέρει add. E, et supra lin. J^2 9 τὸ ἁπλῶς μὴ ὂν J 11 γῇ εἴτε] γῇ ἢ καὶ H 13 τούτῳ διοίσει] διοίσει ἐν τούτῳ F, sed ἐν supra lin. addito ἁπλῶς τι γίνεσθαι EL 14 τῇ ὕλῃ] ἡ ὕλη FHJ ποία L 16 ἧς] τῆς H εἰ om. EL 17 καὶ τὸ εἶδος E δὲ γῆ] γὰρ γῆ F 18 καὶ ταύταις HL 20 μεταβάλῃ EL 21 τὸ post καὶ om. FJΦ^1 22 καὶ τῷ μὴ αἰσθάνεσθαι om. E τῷ om. FLΦ^1 αἰσθάνεσθαι secundum om. L 25 τῷ] τὸ J καὶ ante ζῆν om. E 27 δὴ] δὴ καὶ HJ^2 28 post ἄλλως add. καὶ HJ^2 τὸ ante φθείρεσθαι om. EL 29 πνεύματα γὰρ καὶ ἀὴρ E μὲν om. J 30 τὰ om. F 31 μεταβάλῃ L 32 κατ' ἀλήθειαν δὲ FHL τόδε τι μᾶλλον F τόδε om. J 33 τὴν ἁπλῆν L, spatio post τὴν relicto

σάν τινος, τὴν δὲ φθορὰν τὴν ἁπλῆν γένεσιν οὐσάν τινος, εἴ-
ρηται τὸ αἴτιον (διὰ γὰρ τὸ τὴν ὕλην διαφέρειν ἢ τῷ οὐσίαν 35
εἶναι ἢ τῷ μή, ἢ τῷ τὴν μὲν μᾶλλον τὴν δὲ μή, ἢ τῷ τὴν 319a
μὲν μᾶλλον αἰσθητὴν εἶναι τὴν ὕλην ἐξ ἧς καὶ εἰς ἥν, τὴν
δὲ ἧττον εἶναι)· τοῦ δὲ τὰ μὲν ἁπλῶς γίνεσθαι λέγεσθαι, τὰ
δέ τι μόνον, μὴ τῇ ἐξ ἀλλήλων γενέσει καθ' ὃν εἴπομεν
νῦν τρόπον (νῦν μὲν γὰρ τοσοῦτον διώρισται, τί δή ποτε πά- 5
σης γενέσεως οὔσης φθορᾶς ἄλλου, καὶ πάσης φθορᾶς οὔσης
ἑτέρου τινὸς γενέσεως, οὐχ ὁμοίως ἀποδίδομεν τὸ γίνεσθαι καὶ
τὸ φθείρεσθαι τοῖς εἰς ἄλληλα μεταβάλλουσιν· τὸ δ' ὕστερον
εἰρημένον οὐ τοῦτο διαπορεῖ, ἀλλὰ τί ποτε τὸ μανθάνον μὲν οὐ
λέγεται ἁπλῶς γίνεσθαι ἀλλὰ γίνεσθαι ἐπιστῆμον, τὸ δὲ 10
φυόμενον γίνεσθαι), ταῦτα δὲ διώρισται ταῖς κατηγορίαις.
τὰ μὲν γὰρ τόδε τι σημαίνει, τὰ δὲ τοιόνδε, τὰ δὲ ποσόν·
ὅσα οὖν μὴ οὐσίαν σημαίνει, οὐ λέγεται ἁπλῶς, ἀλλά τι γί-
νεσθαι. οὐ μὴν ἀλλ' ὁμοίως ἐν πᾶσι γένεσις μὲν κατὰ τὰ ἐν
τῇ ἑτέρᾳ συστοιχίᾳ λέγεται, οἷον ἐν μὲν οὐσίᾳ ἐὰν πῦρ ἀλλ' 15
οὐκ ἐὰν γῆ, ἐν δὲ τῷ ποιῷ ἐὰν ἐπιστῆμον ἀλλ' οὐχ ὅταν
ἀνεπιστῆμον. περὶ μὲν οὖν τοῦ τὰ μὲν ἁπλῶς γίνεσθαι τὰ δὲ
μή, καὶ ὅλως καὶ ἐν ταῖς οὐσίαις αὐταῖς, εἴρηται, καὶ διότι
τοῦ γένεσιν εἶναι συνεχῶς αἰτία ὡς ὕλη τὸ ὑποκείμενον, ὅτι
μεταβλητικὸν εἰς τἀναντία καὶ ἔστιν ἡ θατέρου γένεσις ἀεὶ 20
ἐπὶ τῶν οὐσιῶν ἄλλου φθορὰ καὶ ἡ ἄλλου φθορὰ ἄλλου γένε-
σις. ἀλλὰ μὴν οὐδ' ἀπορῆσαι δεῖ διὰ τί γίνεται ἀεὶ ἀπολ-
λυμένων· ὥσπερ γὰρ καὶ τὸ φθείρεσθαι ἁπλῶς φασιν, ὅταν
εἰς ἀναίσθητον ἔλθῃ καὶ τὸ μὴ ὄν, ὁμοίως καὶ τὸ γίνεσθαι ἐκ
μὴ ὄντος φασίν, ὅταν ἐξ ἀναισθήτου. εἶτ' οὖν ὄντος τινὸς τοῦ 25

b 34 *τὴν δὲ . . . τινος* in marg. ponit F *οὖ ταν γένεσιν* J **a** 1 *ἢ τῷ μή . . . δὲ μή* om. E *τῷ μή*] *τὸ μή* J *τὴν μὲν . . . τὴν μὲν* in marg. add. F *τὴν μὲν* utrumque om. J, sec. om. EH 3 *λέγεσθαι* om. L *τὰ* sec.] *τὸ* supra lin. corr. J², *τὸ* etiam Φ^1 (codd. GT) 4 *μόνον* om. Φ^1 5 *νῦν* prius omittend. notat J² 6 *οὔσης φθορᾶς . . .* 7 *γενέσεως* om. L 8 *εἰς ἄλληλα* om. E 9 *τί δή ποτε* F 10 *ἀλλά τι γίγνεσθαι* in marg. F, Γ 12 *τὰ* primum] *τὸ* LΓ *τὰ* sec. et tertium] *τὸ* FLΓ 13 *σημαίνει* in litura J 14 *ἅπασι* F 15 *ἑτέρα συστοιχείαι* J : *ἑτέρᾳ τοῦ κρείττονος συστοιχίᾳ* F 16 *οὐκ* prius] *οὐχὶ* E *ἐπιστήμων* et mox *ἀνεπιστήμων* fort. E, sed correxit 18 *μή*] *πῇ* FHJΓ *καὶ* ante *ἐν* om. EF *αὐταῖς* om. EL 19 *τοῦ* codd. omnes et Γ: *τοῦδε* Bekker perperam tribuit codd. FHL 20 *ἐστιν* ante *εἰς* habet E 21 *ἄλλου* post *ἡ* om. E 22 *ἀεὶ*] *αἰεὶ* JL : *εἰ* E : *τι ἀεὶ* F 23 *φαμεν* E 24 *τὸ* ante *γίνεσθαι* om. EL *ἐκ τοῦ μὴ* F

ὑποκειμένου εἴτε μή, γίνεται ἐκ μὴ ὄντος· ὥστε ὁμοίως καὶ γίνεται ἐκ μὴ ὄντος καὶ φθείρεται εἰς τὸ μὴ ὄν. εἰκότως οὖν οὐχ ὑπολείπει· ἡ γὰρ γένεσις φθορὰ τοῦ μὴ ὄντος, ἡ δὲ φθορὰ γένεσις τοῦ μὴ ὄντος. ἀλλὰ τοῦτο τὸ μὴ ὂν ἁπλῶς
30 [ἀπορήσειέ τις] πότερον τὸ ἕτερον τῶν ἐναντίων ἐστίν, οἷον γῇ καὶ τὸ βαρὺ μὴ ὄν, πῦρ δὲ καὶ τὸ κοῦφον ὄν, ἢ οὔ, ἀλλ' ἐστὶ καὶ γῇ τὸ ὄν, τὸ δὲ μὴ ὂν ὕλη ἡ τῆς γῆς καὶ πυρὸς ὡσαύτως; καὶ ἆρά γε ἑτέρα ἑκατέρου ἡ ὕλη, ἢ οὐκ ἂν γί-
319b νοιτο ἐξ ἀλλήλων οὐδ' ἐξ ἐναντίων (τούτοις γὰρ ὑπάρχει τἀναντία, πυρί, γῇ, ὕδατι, ἀέρι); ἢ ἔστι μὲν ὡς ἡ αὐτή, ἔστι δ' ὡς ἑτέρα; ὃ μὲν γάρ ποτε ὂν ὑπόκειται, τὸ αὐτό, τὸ δ' εἶναι οὐ τὸ αὐτό. περὶ μὲν οὖν τούτων ἐπὶ τοσοῦτον
5 εἰρήσθω·

περὶ δὲ γενέσεως καὶ ἀλλοιώσεως λέγωμεν τί διαφέ- 4
ρουσιν—φαμὲν γὰρ ἑτέρας εἶναι ταύτας τὰς μεταβολὰς ἀλλήλων. ἐπειδὴ οὖν ἐστί τι τὸ ὑποκείμενον καὶ ἕτερον τὸ πάθος ὃ κατὰ τοῦ ὑποκειμένου λέγεσθαι πέφυκεν, καὶ ἔστι μεταβολὴ
10 ἑκατέρου τούτων, ἀλλοίωσις μέν ἐστιν, ὅταν ὑπομένοντος τοῦ ὑποκειμένου, αἰσθητοῦ ὄντος, μεταβάλλῃ ἐν τοῖς ἑαυτοῦ πάθεσιν, ἢ ἐναντίοις οὖσιν ἢ μεταξύ (οἷον τὸ σῶμα ὑγιαίνει καὶ πάλιν κάμνει ὑπομένον γε ταὐτό, καὶ ὁ χαλκὸς στρογγύλος ὁτὲ δὲ γωνιοειδὴς ὁ αὐτός γε ὤν)· ὅταν δ' ὅλον μετα-
15 βάλλῃ μὴ ὑπομένοντος αἰσθητοῦ τινος ὡς ὑποκειμένου τοῦ αὐτοῦ, ἀλλ' οἷον ἐκ τῆς γονῆς αἷμα πάσης ἢ ἐξ ὕδατος ἀὴρ ἢ ἐξ ἀέρος παντὸς ὕδωρ, γένεσις ἤδη τὸ τοιοῦτον, τοῦ δὲ φθορά, μάλιστα δέ, ἂν ἡ μεταβολὴ γίνηται ἐξ ἀναισθήτου εἰς αἰσθητὸν ἢ ἀφῇ ἢ πάσαις ταῖς αἰσθήσεσιν—οἷον ὅταν

a 26 *γίνεται ἐκ μὴ ὄντος* om. L *ὥστε . . .* 27 *ὄντος* om. E *καὶ* om. L, add. supra lin. J 27 *ἐκ μὴ ὄντος* om. FJ, add. supra *γίνεται* H 29 *τοῦτο* add. supra lin. J 30 *ἀπορήσειέ τις* seclusi : om. Φ^1 (codd. GT), et in marg. add. J : *ἀπορήσειεν ἄν τις* Φ^1 (codd. RZ), Bekker : *ἀπορήσειέ τις ἁπλῶς* E *ἐστίν* om. EL 31 post *κοῦφον* add. *τὸ* EL 32 *καὶ ἡ γῇ* J, sed *ἡ* addito *ἡ* om. FJ b 2 *μὲν* om. EJ *ἡ* add. J, prima tamen (ut videtur) manu 3 *ὡς*] *ἡ* (fort. *ᾗ*?), ut videtur, F 4 *οὖν* om. E *τοσούτων εἰρείσθω* J 6 *λέγομεν* H *τί*] *τίνι* Φ^1 8 *ἐπεὶ* H 9 *πέφυκε λέγεσθαι* FL 10 *μὲν οὖν ἐστιν* FL et H, qui tamen rc. m. *οὖν* erasit 11 *μεταβάλῃ* E *ἑαυτοῦ* ELΦ : *αὐτοῦ* J : *αὐτοῦ* FH 12 *ἢ* prius om. HJ, et supra lin. add. F *οὖσιν* om. FL 13 *γε* om. E *ταὐτό*] *αὐτό* F 14 *γωνοειδὴς* E *γε* om. J *μεταβάλῃ* E 15 *τινος αἰσθητοῦ* F *ὡς*] *τοῦ* E 18 *δέ, ἄν*] *δ' ἐὰν* J *ἡ* om. F

ὕδωρ γένηται ἢ φθαρῇ εἰς ἀέρα, ὁ γὰρ ἀὴρ ἐπιεικῶς ἀναί- 20
σθητον. ἐν δὲ τούτοις ἄν τι ὑπομένῃ πάθος τὸ αὐτὸ ἐναντιώ-
σεως ἐν τῷ γενομένῳ καὶ τῷ φθαρέντι (οἷον ὅταν ἐξ ἀέρος
ὕδωρ, εἰ ἄμφω διαφανῆ ἢ ψυχρά), οὐ δεῖ τούτου θάτερον
πάθος εἶναι εἰς ὃ μεταβάλλει· εἰ δὲ μή, ἔσται ἀλλοίωσις.
οἷον ὁ μουσικὸς ἄνθρωπος ἐφθάρη, ἄνθρωπος δ' ἄμουσος ἐγέ- 25
νετο, ὁ δ' ἄνθρωπος ὑπομένει τὸ αὐτό. εἰ μὲν οὖν τούτου μὴ
πάθος ἦν καθ' αὐτὸ ἡ μουσικὴ καὶ ἡ ἀμουσία, τοῦ μὲν γένε-
σις ἦν ἄν, τοῦ δὲ φθορά· νῦν δὲ πάθος τοῦτο τοῦ ὑπομένοντος,
διὸ ἀνθρώπου μὲν ταῦτα πάθη, ἀνθρώπου δὲ μουσικοῦ καὶ
ἀνθρώπου ἀμούσου γένεσις καὶ φθορά—διὸ ἀλλοίωσις τὰ 30
τοιαῦτα. ὅταν μὲν οὖν κατὰ τὸ ποσὸν ᾖ ἡ μεταβολὴ τῆς ἐναν-
τιώσεως, αὔξη καὶ φθίσις, ὅταν δὲ κατὰ τόπον, φορά, ὅταν
δὲ κατὰ τὸ πάθος καὶ τὸ ποιόν, ἀλλοίωσις, ὅταν δὲ μη-
δὲν ὑπομένῃ οὗ θάτερον πάθος ἢ συμβεβηκὸς ὅλως, γένεσις, 320ª
τὸ δὲ φθορά. ἔστι δὲ ἡ ὕλη μάλιστα μὲν κυρίως τὸ ὑπο-
κείμενον γενέσεως καὶ φθορᾶς δεκτικόν, τρόπον δέ τινα καὶ
τὸ ταῖς ἄλλαις μεταβολαῖς, ὅτι πάντα δεκτικὰ τὰ ὑπο-
κείμενα ἐναντιώσεών τινων. περὶ μὲν οὖν γενέσεως, εἴτε 5
ἔστιν εἴτε μή, καὶ πῶς ἔστι, καὶ περὶ ἀλλοιώσεως διωρίσθω
τοῦτον τὸν τρόπον·

περὶ δὲ αὐξήσεως λοιπὸν εἰπεῖν, τί τε διαφέρει γενέ-
σεως καὶ ἀλλοιώσεως, καὶ πῶς αὐξάνεται τῶν αὐξανομέ-
νων ἕκαστον καὶ φθίνει ὁτιοῦν τῶν φθινόντων. σκεπτέον δὴ 10
πρῶτον πότερον μόνως ἐν τῷ περὶ ὅ ἐστιν αὐτῶν ἡ πρὸς ἄλ-
ληλα διαφορά (οἷον ὅτι ἡ μὲν ἐκ τοῦδε εἰς τόδε μεταβολή

b 20 *γίνηται* F 21 *δὲ*] *δὴ* L *ἐάν* FHJ *ὑπομείνῃ* E 22 *τῷ* post *καὶ* om. EL 23 *ὕδωρ καὶ εἰ* EH *ἢ*] *ᾗ* Φ^c *ψυχρά*] humida Γ *οὐ δεῖ*] *οὐ δ' εἰ* J 25 *ὁ* om. F *ἄνθρ. δ' ἄμ.*] *ἄμουσος ὁ ἄνθρωπος* E 27 *αὐτὸ*] *αὐτὸν* E *ἡ* ante *ἀμουσία* om. Φ^c *τοῦ* fecit ex *αὐτοῦ* vel *τούτου* F 28 *ἂν ἦν* FHL *νῦν . . . ὑπομένοντος*, quae post 30 *φθορά* codd. habent, huc e Philoponi coni. transtuli 29 *καὶ ἀνθρ.*] *ἡ ἀνθρώπου* E 30 *τὰ τοιαῦτα*] *ταῦτα* Φ^c 31 *τὸ* om. EFΦ^1 32 *αὔξησις* FHL *φορά, ὅταν δὲ κατὰ* om. E 33 *τὸ* prius om. EL a 1 *ὑπομένει* J *ἢ*] *καὶ* F 2 *δὲ ἡ*] *δὲ* om. J : *ἡ* om. L *καὶ* post *μὲν* add. L 5 *ἐναντ. τινων*] *τῶν ἐναντιώσεων* L *οὖν* om. FL post *γενέσεως* add. Bekker *καὶ φθορᾶς*, quae perperam tribuit codici E 6 *καὶ πῶς . . . ἀλλοιώσεως* om. F 8 *τί*] *τίνι* LΦ 9 *αὐξάνεται τῶν* om. F, sed *αὐξα* add. in marg. 10 *ἕκαστον* ante 9 *τῶν* ponit J 11 *πρῶτον* om. L *μόνως* om. F^{1}H *ἐν τῷ* om. E *ἡ* post *ἄλληλα* ponit E

—οἷον ἐκ δυνάμει οὐσίας εἰς ἐντελεχείᾳ οὐσίαν—γένεσίς ἐστιν, ἡ δὲ περὶ μέγεθος αὔξησις, ἡ δὲ περὶ πάθος ἀλλοίωσις, ἀμφότερα δὲ ἐκ δυνάμει ὄντων εἰς ἐντελέχειαν μεταβολὴ τῶν εἰρημένων ἐστίν) ἢ καὶ ὁ τρόπος διαφέρει τῆς μεταβολῆς—φαίνεται γὰρ τὸ μὲν ἀλλοιούμενον οὐκ ἐξ ἀνάγκης μεταβάλλον κατὰ τόπον, οὐδὲ τὸ γινόμενον, τὸ δ' αὐξανόμενον καὶ τὸ φθῖνον, ἄλλον δὲ τρόπον τοῦ φερομένου. τὸ μὲν γὰρ φερόμενον ὅλον ἀλλάττει τόπον, τὸ δ' αὐξανόμενον ὥσπερ τὸ ἐλαυνόμενον. τούτου γὰρ μένοντος τὰ μόρια μεταβάλλει κατὰ τόπον, οὐχ ὥσπερ τὰ τῆς σφαίρας· τὰ μὲν γὰρ ἐν τῷ ἴσῳ τόπῳ μεταβάλλει τοῦ ὅλου μένοντος, τὰ δὲ τοῦ αὐξανομένου ἀεὶ ἐπὶ πλείω τόπον, ἐπ' ἐλάττω δὲ τὰ τοῦ φθίνοντος. ὅτι μὲν οὖν ἡ μεταβολὴ διαφέρει οὐ μόνον περὶ ὃ ἀλλὰ καὶ ὡς τοῦ τε γινομένου καὶ ἀλλοιουμένου καὶ αὐξανομένου, δῆλον. περὶ δὲ ὃ ἡ μεταβολή ἐστιν ἡ τῆς αὐξήσεως καὶ ἡ τῆς φθίσεως (περὶ μέγεθος δὲ δοκεῖ εἶναι τὸ αὐξάνεσθαι καὶ φθίνειν), ποτέρως ὑποληπτέον, πότερον ἐκ δυνάμει μὲν μεγέθους καὶ σώματος, ἐντελεχείᾳ δ' ἀσωμάτου καὶ ἀμεγέθους γίνεσθαι σῶμα καὶ μέγεθος; καὶ τούτου διχῶς ἐνδεχομένου λέγειν, ποτέρως ἡ αὔξησις γίγνεται, πότερον ἐκ κεχωρισμένης αὐτῆς καθ' αὑτὴν τῆς ὕλης, ἢ ἐνυπαρχούσης ἐν ἄλλῳ σώματι; ἢ ἀδύνατον ἀμφοτέρως; χωριστὴ μὲν γὰρ οὖσα ἡ οὐδένα καθέξει τόπον ([ἢ] οἷον στιγμή τις), ἢ κενὸν ἔσται καὶ σῶμα οὐκ αἰσθητόν· τούτων δὲ τὸ μὲν οὐκ ἐνδέχεται, τὸ δὲ ἀναγκαῖον ἔν τινι εἶναι. ἀεὶ γάρ που ἔσται τὸ γιγνόμενον ἐξ αὐτοῦ, ὥστε κἀκεῖνο, ἢ καθ' αὑτὸ ἢ κατὰ συμβεβηκός. ἀλλὰ μὴν εἴ γ' ἔν τινι ὑπάρξει, εἰ μὲν κεχωρισμένον οὕτως ὥστε μὴ ἐκείνου καθ' αὑτὸ ἢ κατὰ συμβεβηκός τι εἶναι, συμβήσεται πολλὰ καὶ ἀδύνατα. λέγω

a 13 οἷον ἡ ἐκ H ἐντελέχειαν E¹J ἐστιν in marg. add. E 14 περὶ τὸ μέγεθος E post αὔξησις in marg. add. καὶ φθίσις EF 15 ἀμφοτέρων F ἐκ τῶν δυνάμει FHJ 16 ἢ om. J 19 τὸ prius add. supra lin. J 20 ἐναλλάττει τὸν τόπον F αὐξόμενον H 21 τούτου μὲν γὰρ F¹ 24 et 27 αὐξομένου H 24 δὲ post ἐλάττω om. J 25 τὰ om. EHJ, in marg. add. F διαφέρει ἡ μεταβολὴ J 27 δὲ ὃ] ὃ δὲ H ἐστιν ἡ μεταβολὴ FHL ἡ ante τῆς om. L 28 ἡ om. J δὲ om. J b 1 μὲν om. E ἢ οἷον] ἢ seclusi : οἷον γὰρ (γρ.) Φᶜ : οἷον Γ 2 τις om. E, et Φ¹ (codd. RZ) καὶ] ἢ καὶ F² : ἢ L 3 ἀναγκαῖον δηλονότι ἐν F 6 νου . . . συμβεβηκός om. E, et καθ' . . . συμβεβηκός om. Φ καθ'] ἢ καθ' L 7 τι post 6 ἐκείνου J

δ' οἷον εἰ γίγνεται ἀὴρ ἐξ ὕδατος, οὐ τοῦ ὕδατος ἔσται μεταβάλλοντος, ἀλλὰ διὰ τὸ ὥσπερ ἐν ἀγγείῳ τῷ ὕδατι ἐνεῖναι τὴν ὕλην αὐτοῦ. ἀπείρους γὰρ οὐδὲν κωλύει ὕλας εἶναι, ὥστε καὶ γίγνεσθαι ἐντελεχείᾳ· ἔτι δ' οὐδ' οὕτω φαίνεται γιγνόμενος ἀὴρ ἐξ ὕδατος, οἷον ἐξιὼν ὑπομένοντος. βέλτιον τοίνυν ποιεῖν πᾶσιν ἀχώριστον τὴν ὕλην ὡς οὖσαν τὴν αὐτὴν καὶ μίαν τῷ ἀριθμῷ, τῷ λόγῳ δὲ μὴ μίαν. ἀλλὰ μὴν οὐδὲ στιγμὰς θετέον οὐδὲ γραμμὰς τὴν τοῦ σώματος ὕλην διὰ τὰς αὐτὰς αἰτίας· ἐκεῖνο δὲ οὗ ταῦτα ἔσχατα ἡ ὕλη, ἣν οὐδέποτ' ἄνευ πάθους οἷόν τε εἶναι οὐδ' ἄνευ μορφῆς. γίγνεται μὲν οὖν ἁπλῶς ἕτερον ἐξ ἑτέρου, ὥσπερ καὶ ἐν ἄλλοις διώρισται, καὶ ὑπό τινος δὲ ἐντελεχείᾳ ὄντος ἢ ὁμογενοῦς ἢ ὁμοειδοῦς (οἷον πῦρ ὑπὸ πυρὸς ἢ ἄνθρωπος ὑπ' ἀνθρώπου) ἢ ὑπ' ἐντελεχείας [σκληρὸν γὰρ οὐχ ὑπὸ σκληροῦ γίνεται]· ἐπεὶ δ' ἐστὶ καὶ οὐσίας ὕλη σωματικῆς, σώματος δ' ἤδη τοιουδί (σῶμα γὰρ κοινὸν οὐδέν), ἡ αὐτὴ καὶ μεγέθους καὶ πάθους ἐστί, τῷ μὲν λόγῳ χωριστή, τόπῳ δ' οὐ χωριστή, εἰ μὴ καὶ τὰ πάθη χωριστά. φανερὸν δὲ ἐκ τῶν διηπορημένων ὅτι οὐκ ἔστιν ἡ αὔξησις μεταβολὴ ἐκ δυνάμει μεγέθους, ἐντελεχείᾳ δὲ μηδὲν ἔχοντος μέγεθος· χωριστὸν γὰρ ἂν εἴη τὸ κενόν, τοῦτο δ' ὅτι ἀδύνατον, εἴρηται ἐν ἑτέροις πρότερον. ἔτι δ' ἥ γε τοιαύτη μεταβολὴ οὐκ αὐξήσεως ἴδιος ἀλλὰ γενέσεως ὅλως. ἡ γὰρ αὔξησίς ἐστι τοῦ ὑπάρχοντος μεγέθους ἐπίδοσις, ἡ δὲ φθίσις μείωσις (διὸ δὴ ἔχειν τι δεῖ μέγεθος τὸ αὐξανόμενον), ὥστ' οὐκ ἐξ ἀμεγέθους ὕλης δεῖ εἶναι τὴν αὔξησιν εἰς ἐντελέχειαν μεγέθους· γένεσις γὰρ ἂν εἴη σώματος μᾶλλον, οὐκ αὔξησις. ληπτέον δὴ μᾶλλον οἷον ἀπτομένους

b 9 *ἐνεῖναι*] *εἶναι* EL 11 δ' om. F¹J *οἰδ'*] *οὐχ* HJΦ, et fecerunt EF 13 *ποιεῖν* post *ἀχώριστον* ponit F *εἶναι τὴν ὕλην* FHJ *ὡς* om. L 14 *τῷ* prius om. J, et Φᵉ excepto libro Z *μὴ μίαν*] *μηδὲ μίαν* F : *μηδεμίαν* J : *μὴ* om. E 16 *ἣν*] *ἦν ἣν* FHJ 17 *οἷόν τε*] *οἵονται* J 18 *ἁπλῶς ἡ ὁμογενοῦς ἕτερον* F¹ *ἄλλοις*] *ἑτέροις* Φ : *οις* E 19 *ὑπό*] *ἀπό* F *δὲ ἀεὶ ἐντελεχείᾳ* E *ὁμοειδοῦς ἢ ὁμογενοῦς* EL 20 *ἢ ἄνθρωπος*] *κἄνθρωπος* E 21 *σκληρὸν . . . γίνεται* aut eiicienda, aut post 19 *ὁμογενοῖς* legenda *γὰρ* om. E 22 *σώματος . . .* 23 *οὐδέν* post 25 *χωριστά* ponit L *δ' ἤδη*] *ἤδη* F : *δ' ἢ τ*, et post *τ* suprascr. *οι*, E 23 *κοινὸν γὰρ* F 24 *ἐστί* om. L 25 *τὰ* om. E *δὲ*] in litura J : *δὴ* L 27 *κενόν* EF¹ : *κοινόν* HJLΓ et (γρ.) F² : utrumque agnovit Φᵉ 28 *τοῦτο*] *τοῦ* L *ἐν ἑτέροις* om. HL, in marg. add. F 29 δ' om. L 30 *ὅλως* om. F *ἐννπάρχοντος* F¹HL 31 *δὴ*] *δεῖ* FJ *τι δεῖ*] *τι* EF : *τοδει* J 33 *σώματος μᾶλλον*] *μᾶλλον σώματος* F

321ª τῆς ζητήσεως ἐξ ἀρχῆς, ποίου τινὸς ὄντος τοῦ αὐξάνεσθαι ἢ τοῦ φθίνειν τὰ αἴτια ζητοῦμεν. φαίνεται δὴ τοῦ αὐξανομένου ὁτιοῦν μέρος ηὐξῆσθαι, ὁμοίως δὲ καὶ ἐν τῷ φθίνειν ἔλαττον γεγονέναι, ἔτι δὲ προσιόντος τινὸς αὐξάνεσθαι καὶ ἀπιόντος φθίνειν. ἀναγκαῖον δὴ ἢ ἀσωμάτῳ αὐξάνεσθαι ἢ σώματι. εἰ μὲν οὖν ἀσωμάτῳ, ἔσται χωριστὸν κενόν—ἀδύνατον δὲ μεγέθους ὕλην εἶναι χωριστήν, ὥσπερ εἴρηται πρότερον· εἰ δὲ σώματι, δύο ἐν τῷ αὐτῷ σώματα τόπῳ ἔσται, τό τε αὐξανόμενον καὶ τὸ αὔξον, ἔστι δὲ καὶ τοῦτο ἀδύνατον. ἀλλὰ μὴν οὐδ' οὕτως ἐνδέχεται λέγειν γίνεσθαι τὴν αὔξησιν ἢ τὴν φθίσιν, ὥσπερ ὅταν ἐξ ὕδατος ἀήρ· τότε γὰρ μείζων ὁ ὄγκος γέγονεν· οὐ γὰρ αὔξησις τοῦτο ἀλλὰ γένεσις μὲν τοῦ εἰς ὃ μεταβάλλει ἔσται, φθορὰ δὲ τοῦ ἐναντίου, αὔξησις δὲ οὐδετέρου, ἀλλ' ἢ οὐδενὸς ἢ εἴ τι κοινὸν ἀμφοῖν ὑπάρχει, τῷ γινομένῳ καὶ τῷ φθαρέντι, οἷον εἰ σῶμα. τὸ δ' ὕδωρ οὐκ ηὔξηται οὐδ' ὁ ἀήρ, ἀλλὰ τὸ μὲν ἀπόλωλε τὸ δὲ γέγονεν· τὸ σῶμα δέ, εἴπερ, ηὔξηται. ἀλλὰ καὶ τοῦτ' ἀδύνατον. δεῖ γὰρ σώζειν τῷ λόγῳ τὰ ὑπάρχοντα τῷ αὐξανομένῳ καὶ φθίνοντι. ταῦτα δὲ τρία ἐστίν, ὧν ἓν μέν ἐστι τὸ ὁτιοῦν μέρος μεῖζον εἶναι τοῦ αὐξανομένου μεγέθους, οἷον εἰ σὰρξ τῆς σαρκός, καὶ προσιόντος τινός, καὶ τρίτον σωζομένου τοῦ αὐξανομένου καὶ ὑπομένοντος· ἐν μὲν γὰρ τῷ γίγνεσθαί τι ἁπλῶς ἢ φθείρεσθαι οὐχ ὑπομένει, ἐν δὲ τῷ ἀλλοιοῦσθαι καὶ αὐξάνεσθαι ἢ φθίνειν ὑπομένει τὸ αὐτὸ τὸ αὐξανόμενον ἢ ἀλλοιούμενον, ἀλλ' ἔνθα μὲν τὸ πάθος ἔνθα δὲ τὸ μέγεθος τὸ αὐτὸ οὐ μένει. εἰ δὴ ἔσται ἡ εἰρημένη αὔξησις, ἐνδέχοιτ' ἂν μηδενός γε προσιόντος μηδὲ ὑπομένοντος αὐξάνεσθαι καὶ μηδενὸς ἀπιόντος φθίνειν καὶ μὴ ὑπομένειν τὸ αὐξανόμενον. ἀλλὰ δεῖ τοῦτο σώζειν· ὑπόκειται γὰρ ἡ αὔξησις τοιοῦτον. ἀπορήσειε

a 2 δὴ οὖν τοῦ L 4 δὲ om. E 5 ἀναγκαῖον] ἀνάγκη EL δὴ] δὲ E 6 τὸ ante κενόν add. FL : τι Γ κενόν] κοινόν F^2Γ et (γρ.) $Φ^c$ 8 σώματα ante ἐν L, post τόπῳ ponunt Φ et (supra lin. additum) E αὐξόμενον HL 9 τοῦτο] αὐτὸ L 10 ἢ] καὶ L 13 μετέβαλλεν EL φθορὰ] φορὰ J 14 ἀμφοῖν] ἄμφω EL 14–15 τῷ φθ. καὶ τῷ γ. L : τῷ γ. καὶ φθ. F : τῷ φθ. καὶ τῷ γενομένῳ $Φ^1$: τῷ φθαρέντι E 17 εἴπερ] εἰ E 18 καὶ τι (suprascr. ω) φθίνοντι E 19 ἐν om. E μεῖζον μέρος E εἶναι] γίγνεσθαι L 20 μεγέθους om. E εἰ om. E, addito sec. manu ἡ : εἰ supra lin. add. F : ἡ L 23 καὶ] ἢ FHL αὔξεσθαι F 24 τὸ αὐτὸ supra lin. add. F τὸ secundum om. L 26 γε] τε FHJ 27 μηδὲ ὑπομένοντος melius abessent

δ' ἄν τις καὶ τί ἐστι τὸ αὐξανόμενον, πότερον ᾧ προστίθεταί τι, οἷον εἰ τὴν κνήμην αὐξάνει, αὕτη μείζων, ᾧ δὲ αὐξάνει, ἡ τροφή, οὔ. διὰ τί δὴ οὖν οὐκ ἄμφω ηὔξηται; μεῖζον γὰρ καὶ ὃ καὶ ᾧ, ὥσπερ ὅταν μίξῃς οἶνον ὕδατι· ὁμοίως γὰρ πλεῖον ἑκάτερον. ἢ ὅτι τοῦ μὲν μένει ἡ οὐσία, τοῦ δ' οὔ, οἷον τῆς τροφῆς; ἐπεὶ καὶ ἐνταῦθα τὸ ἐπικρατοῦν λέγεται ἐν τῇ μίξει, οἷον ὅτι οἶνος· ποιεῖ γὰρ τὸ τοῦ οἴνου ἔργον ἀλλ' οὐ τὸ τοῦ ὕδατος τὸ σύνολον μῖγμα. ὁμοίως δὲ καὶ ἐπ' ἀλλοιώσεως, εἰ μένει σὰρξ οὖσα καὶ τὸ τί ἐστι, πάθος δέ τι ὑπάρχει τῶν καθ' αὑτό, ὃ πρότερον οὐχ ὑπῆρχεν, ἠλλοίωται τοῦτο· ᾧ δ' ἠλλοίωται, ὁτὲ μὲν οὐδὲν πέπονθεν, ὁτὲ δὲ κἀκεῖνο. ἀλλὰ τὸ ἀλλοιοῦν καὶ ἡ ἀρχὴ τῆς κινήσεως ἐν τῷ αὐξανομένῳ καὶ τῷ ἀλλοιουμένῳ (ἐν τούτοις γὰρ τὸ κινοῦν)· ἐπεὶ καὶ τὸ εἰσελθὸν γένοιτ' ἄν ποτε μεῖζον καὶ τὸ ἀπολαῦσαν αὐτοῦ σῶμα, οἷον εἰ εἰσελθὸν γένοιτο πνεῦμα—ἀλλ' ἔφθαρταί γε τοῦτο παθόν, καὶ τὸ κινοῦν οὐκ ἐν τούτῳ. ἐπεὶ δὲ διηπόρηται περὶ αὐτῶν ἱκανῶς, δεῖ καὶ τῆς ἀπορίας πειρᾶσθαι λύσιν εὑρεῖν, σώζοντας τὸ ὑπομένοντός τε τοῦ αὐξανομένου καὶ προσιόντος τινὸς αὐξάνεσθαι, ἀπιόντος δὲ φθίνειν, ἔτι δὲ τὸ ὁτιοῦν σημεῖον αἰσθητὸν ἢ μεῖζον ἢ ἔλαττον γεγονέναι, καὶ μήτε κενὸν εἶναι τὸ σῶμα μήτε δύο ἐν τῷ αὐτῷ τόπῳ μεγέθη μήτε ἀσωμάτῳ αὐξάνεσθαι. ληπτέον δὲ τὸ αἴτιον διορισαμένοις πρῶτον ἓν μὲν ὅτι τὰ ἀνομοιομερῆ αὐξάνεται τῷ τὰ ὁμοιομερῆ αὐξάνεσθαι (σύγκειται γὰρ ἐκ τούτων ἕκαστον), ἔπειθ' ὅτι σὰρξ καὶ ὀστοῦν καὶ ἕκαστον τῶν τοιούτων μορίων ἐστὶ διττόν, ὥσπερ καὶ τῶν ἄλλων τῶν ἐν ὕλῃ εἶδος ἐχόντων· καὶ γὰρ ἡ ὕλη λέγεται καὶ τὸ εἶδος σὰρξ καὶ ὀστοῦν. τὸ οὖν ὁτιοῦν μέρος αὐξάνεσθαι καὶ προσιόντος τινὸς κατὰ μὲν τὸ εἶδός ἐστιν ἐνδεχόμενον, κατὰ δὲ τὴν ὕλην οὐκ ἔστιν. δεῖ γὰρ νοῆσαι ὥσπερ εἴ τις μετροίη τῷ αὐτῷ μέ-

a 31 ᾧ] ὃ F 32 οὔ om. HJLΓ, et erasit E² δῆ] δεῖ J οὖν om. E¹ οὐκ om. Bekker errore typogr. 33 καὶ prius om. F ὃ καὶ ᾧ om. E ὥσπερ καὶ ὅταν F² b 5 τοῦτο om. E : τότε H ᾧ δ' ἠλλοίωται om. E post πέπονθεν add. οὐδ' ἠλλοίωται ἡ οὐσία ΦΓ ὁτὲ δὲ] οὐδ' ὁτὲ F 9 εἰ om. EF 10 γε] τε E παθων J ἐπεὶ δὲ] ἐπειδὴ δὲ FL : ἐπειδὴ vel ἐπειδὴ δὲ Φ¹ 13 αὔξεσθαι FL 15 τὸ om. L 16 μήτε] μηδὲ EJ αὔξεσθαι J δὲ] δὴ FLΦ¹ 17 τὸ αἴτιον om. H διωρισαμένοις J ἓν om. L ὁμοιομερῆ E 19 ἕκαστον prius om. E ἕκαστον τῶν τοιούτων] τούτων ἕκαστον τῶν L 20 διττῶν E 22 καὶ prius] ἡ FL

τρῳ ὕδωρ· ἀεὶ γὰρ ἄλλο καὶ ἄλλο τὸ γινόμενον. οὕτω δ' αὐξάνεται ἡ ὕλη τῆς σαρκός, καὶ οὐχ ὁτῳοῦν παντὶ προσγίνεται, ἀλλὰ τὸ μὲν ὑπεκρεῖ τὸ δὲ προσέρχεται, τοῦ δὲ σχήματος καὶ τοῦ εἴδους ὁτῳοῦν μορίῳ. ἐπὶ τῶν ἀνομοιομερῶν δὲ τοῦτο μᾶλλον δῆλον, οἷον χειρός, ὅτι ἀνάλογον ηὔξηται—ἡ γὰρ ὕλη ἑτέρα οὖσα δῆλη μᾶλλον τοῦ εἴδους ἐνταῦθα ἢ ἐπὶ σαρκὸς καὶ τῶν ὁμοιομερῶν, διὸ καὶ τεθνεῶτος μᾶλλον ἂν δόξειεν εἶναι ἔτι σὰρξ καὶ ὀστοῦν ἢ χεὶρ καὶ βραχίων. ὥστε ἔστι μὲν ὡς ὁτιοῦν τῆς σαρκὸς ηὔξηται, ἔστι δ' ὡς οὔ· κατὰ μὲν γὰρ τὸ εἶδος ὁτῳοῦν προσελήλυθεν, κατὰ δὲ τὴν ὕλην οὔ. μεῖζον μέντοι τὸ ὅλον γέγονε προσελθόντος μέν τινος, ὃ καλεῖται τροφὴ καὶ ἐναντίον, μεταβάλλοντος δὲ εἰς τὸ αὐτὸ εἶδος, οἷον εἰ ξηρῷ προσίοι ὑγρόν, προσελθὸν δὲ μεταβάλλοι καὶ γένοιτο ξηρόν· ἔστι μὲν γὰρ ὡς τὸ ὅμοιον ὁμοίῳ αὐξάνεται, ἔστι δ' ὡς ἀνομοίῳ. ἀπορήσειε δ' ἄν τις ποιόν τι δεῖ εἶναι τὸ ᾧ αὐξάνεται. φανερὸν δὴ ὅτι δυνάμει ἐκεῖνο, οἷον εἰ σὰρξ δυνάμει σάρκα· ἐντελεχείᾳ ἄρα ἄλλο. φθαρὲν δὴ τοῦτο σὰρξ γέγονεν· οὐκοῦν οὐ τοῦτο αὐτὸ καθ' αὑτό (γένεσις γὰρ ἂν ἦν, οὐκ αὔξησις) ἀλλὰ τὸ αὐξανόμενον τούτῳ. τί οὖν παθὸν ὑπὸ τούτου [ηὐξήθη]; ἢ μιχθέν, ὥσπερ οἴνῳ εἴ τις ἐπιχέοι ὕδωρ, ὁ δὲ δύναιτο οἶνον ποιεῖν τὸ μιχθέν; καὶ ὥσπερ τὸ πῦρ ἀψάμενον τοῦ καυστοῦ, οὕτως ἐν τῷ αὐξανομένῳ καὶ ὄντι ἐντελεχείᾳ σαρκὶ τὸ ἐνὸν αὐξητικὸν προσελθόντος δυνάμει σαρκὸς ἐποίησεν ἐντελεχείᾳ σάρκα. οὐκοῦν ἅμα ὄντος· εἰ γὰρ χωρίς, γένεσις. ἔστι μὲν γὰρ οὕτω πῦρ ποιῆσαι ἐπὶ τὸ ὑπάρχον ἐπιθέντα ξύλα· ἀλλ' οὕτω μὲν αὔξησις, ὅταν δὲ αὐτὰ τὰ ξύλα ἀφθῇ, γένεσις. ποσὸν δὲ τὸ μὲν καθόλου οὐ γίνεται, ὥσπερ οὐδὲ ζῷον ὃ μήτ' ἄνθρωπος μήτε τῶν

b 25 δ'] δὴ F : καὶ L 26 οὐχ] οὐχὶ FHJ ὁτῳοῦν] οὕτωοῦν E 28 ὁτοοῦν μόριον E^1 δὲ ante τῶν ponunt FHL 31 ἂν om. F 32 ἔτι εἶναι J βραχείων J 34 μὲν] μέντοι F 35 γέγονε τὸ ὅλον EL a 1 ἐναντίου EJ 2 προσίοι] προστεθῇ E : προσίῃ L μεταβάλοι EL 3 ὡς supra lin. add. J 4 ἀπορήσαι E τὸ om. E 5 αὔξεται F 7 τοῦτο om. L καθ' αὑτό om. E ἂν om. F 9 ηὐξήθη aut eiiciendum, aut post 8 τούτῳ legendum, aut ηὔξησεν cum Φ^c (p. 117. 12) scribendum ὥσπερ ὑγρῷ ἢ οἴνῳ (ἢ tamen sec. manu addito) E : ὥσπερ ἂν οἴνῳ H εἴ om. E : εἴ τις ante οἴνῳ ponit L ἐπιχέαι HJ : ἐπιχεεῖ fecit E^2 10 δύνατο E : δύναται F καὶ $H\Phi^c$: om. EFJLΓ 13 σάρκα om. E 14 ἔστι . . . 16 γένεσις om. L 15 ἐπιτιθέντα F : adiungentes Γ 17 μήτε τι τῶν $H\Phi^1\Gamma$, fort. recte

καθ' ἕκαστα (ἀλλ' ὡς ἐνταῦθα τὸ καθόλου, κἀκεῖ τὸ ποσόν), σὰρξ δὲ ἢ ὀστοῦν ἢ χεὶρ ⟨ἢ βραχίων⟩ καὶ τούτων τὰ ὁμοιομερῆ· προσελθόντος μὲν δή τινος ποσοῦ, ἀλλ' οὐ σαρκὸς ποσῆς. ᾗ μὲν οὖν δυνάμει τὸ συναμφότερον, οἷον ποσὴ σάρξ, ταύτῃ μὲν αὔξει (καὶ γὰρ ποσὴν δεῖ γίνεσθαι καὶ σάρκα), ᾗ δὲ μόνον σάρξ, τρέφει· ταύτῃ γὰρ διαφέρει τροφὴ καὶ αὔξησις τῷ λόγῳ. διὸ τρέφεται μὲν ἕως ἂν σώζηται καὶ φθῖνον, αὔξεται δὲ οὐκ ἀεί, καὶ ἡ τροφὴ τῇ αὐξήσει τὸ αὐτὸ μέν, τὸ δ' εἶναι ἄλλο· ᾗ μὲν γάρ ἐστι τὸ προσιὸν δυνάμει ποσὴ σάρξ, ταύτῃ μὲν αὐξητικὸν σαρκός, ᾗ δὲ μόνον δυνάμει σάρξ, τροφή. τοῦτο δὲ τὸ εἶδος [ἄνευ ὕλης], οἷον αὐλός, δύναμίς τις ἐν ὕλῃ ἐστίν. ἐὰν δή τις προσίῃ ὕλη, οὖσα δυνάμει αὐλός, ἔχουσα καὶ τὸ ποσὸν δυνάμει, οὗτοι ἔσονται μείζους αὐλοί. ἐὰν δὲ μηκέτι ποιεῖν δύνηται, ἀλλ' οἷον ὕδωρ οἴνῳ ἀεὶ πλεῖον μιγνύμενον τέλος ὑδαρῆ ποιεῖ καὶ ὕδωρ, τότε φθίσιν ποιήσει τοῦ ποσοῦ· τὸ δ' εἶδος μένει.

6 Ἐπεὶ δὲ πρῶτον δεῖ περὶ τῆς ὕλης καὶ τῶν καλουμένων στοιχείων εἰπεῖν, εἴτ' ἐστὶν εἴτε μή, καὶ πότερον ἀΐδιον ἕκαστον ἢ γίγνεταί πως, καὶ εἰ γίνεται, πότερον ἐξ ἀλλήλων γίνεται πάντα τὸν αὐτὸν τρόπον ἤ τι πρῶτον ἐν αὐτῶν ἐστιν— ἀνάγκη δὴ πρότερον εἰπεῖν περὶ ὧν ἀδιορίστως λέγεται νῦν. πάντες γὰρ οἵ τε τὰ στοιχεῖα γεννῶντες καὶ οἱ τὰ ἐκ τῶν 322b

a 19 δὲ] δὲ γοῦν L^2 ἢ χεὶρ ἢ ὀστοῦν JΦ¹ ἢ νεῦρα post χεὶρ add. D^b : ἢ βραχίων e coni. addidi, coll. 321b 32 20 μὲν δή om. L : μὲν om. Φ¹ 21 ἀμφότερον E^1 22 δεῖ] ἀεὶ E γενέσθαι J μόνη Φ¹ 23 ταύτῃ γὰρ] ταύτη καὶ γὰρ ταύτη E, et F qui ταύτη secundum supra lin. add. : ταύτῃ· καὶ γὰρ Φ¹ 24 φθῖνον] φθίνῃ (correcto η) E : φθίνῃ H : φθίνει F αὐξάνεται EL 25 αὐξήσει] αὔξῃ H : αὔξῃ J μέν, τὸ] μέν, τῷ F 26 δ' om. E 27 σάρξ, ὃ ταύτῃ E 28 ἄνευ ὕλης seclusi, vide infra ad v. 29 δύναμίς τις] τις δύναμις Φ¹ 28 et 30 ἄϋλος, 31 ἄϋλοι codd. omnes, Φ et Bekker : αὐλός et αὐλοί scripsi, coll. $Φ^c$ (pp. 109. 26–110. 7) : 'tibia' et 'tibiae' vertit Vatablus 29 post ἐστίν add. prima manu ὁμοίως δὲ καὶ ἄλλο τι οὗν ὄργανον J, inter ἄλλο et τι suprascr. ὅ. Habent etiam eadem verba Γ et Vatablus, sed una cum ἄνευ ὕλης (v. 28) eieci : suspicor enim haec omnia, ad explicandum αὐλός vel ἄϋλος in margine ascripta, inde in textum irrepsisse δή] δέ FHJL, et fecit E προσίοι F 31 δύναται EF οἴνῳ ὕδωρ ELΦ¹ 32 ποιεῖ] ποιῇ fecit E 33 ποιήσει] om. E : ποιει et in spatio trium litterarum incerta quaedam F : ποιείται L b 1 ἐπεὶ] ἐπειδὴ F 3 γίγνεται] γίγνονται E : γίνονται Φ πως . . . γίνεται om. E^1 4 γίγνονται E ἤ] εἰ J πρῶτον] πρότερον FHJ, sed γρ. πρῶτον supra lin. add. F 5 δὴ om. EΦ πρότερον] πρῶτον L 6 τε om. L

στοιχείων διακρίσει χρῶνται καὶ συγκρίσει καὶ τῷ ποιεῖν καὶ πάσχειν. ἔστι δ' ἡ σύγκρισις μίξις· πῶς δὲ μίγνυσθαι λέγομεν, οὐ διώρισται σαφῶς. ἀλλὰ μὴν οὐδ' ἀλλοιοῦσθαι δυνατόν, οὐδὲ διακρίνεσθαι καὶ συγκρίνεσθαι, μηδενὸς ποιοῦντος μηδὲ πάσχοντος. καὶ γὰρ οἱ πλείω τὰ στοιχεῖα ποιοῦντες γεννῶσι τῷ ποιεῖν καὶ πάσχειν ὑπ' ἀλλήλων, καὶ τοῖς ἐξ ἑνὸς ἀνάγκη λέγειν τὴν ποίησιν· καὶ τοῦτ' ὀρθῶς λέγει Διογένης, ὅτι εἰ μὴ ἦν ἐξ ἑνὸς ἅπαντα, οὐκ ἂν ἦν τὸ ποιεῖν καὶ τὸ πάσχειν ὑπ' ἀλλήλων, οἷον τὸ θερμὸν ψύχεσθαι καὶ τοῦτο θερμαίνεσθαι πάλιν—οὐ γὰρ ἡ θερμότης μεταβάλλει καὶ ἡ ψυχρότης εἰς ἄλληλα, ἀλλὰ δῆλον ὅτι τὸ ὑποκείμενον, ὥστε ἐν οἷς τὸ ποιεῖν ἐστι καὶ τὸ πάσχειν, ἀνάγκη τούτων μίαν εἶναι τὴν ὑποκειμένην φύσιν. τὸ μὲν οὖν πάντα τοιαῦτα εἶναι φάσκειν οὐκ ἀληθές, ἀλλ' ἐν ὅσοις τὸ ὑπ' ἀλλήλων ἐστίν. ἀλλὰ μὴν εἰ περὶ τοῦ ποιεῖν καὶ πάσχειν καὶ περὶ μίξεως θεωρητέον, ἀνάγκη καὶ περὶ ἁφῆς· οὔτε γὰρ ποιεῖν ταῦτα καὶ πάσχειν δύναται κυρίως ἃ μὴ οἷόν τε ἅψασθαι ἀλλήλων, οὔτε μὴ ἁψάμενά πως ἐνδέχεται μιχθῆναι πρῶτον· ὥστε περὶ τριῶν τούτων διοριστέον, τί ἁφὴ καὶ τί μίξις καὶ τί ποίησις. ἀρχὴν δὲ λάβωμεν τήνδε. ἀνάγκη γὰρ τῶν ὄντων ὅσοις ἐστὶ μίξις, εἶναι ταῦτ' ἀλλήλων ἁπτικά, κἂν εἴ τι ποιεῖ, τὸ δὲ πάσχει κυρίως, καὶ τούτοις ὡσαύτως· διὸ πρῶτον λεκτέον περὶ ἁφῆς. σχεδὸν μὲν οὖν ὥσπερ καὶ τῶν ἄλλων ὀνομάτων ἕκαστον λέγεται πολλαχῶς, καὶ τὰ μὲν ὁμωνύμως τὰ δὲ θάτερα ἀπὸ τῶν ἑτέρων καὶ τῶν προτέρων, οὕτως ἔχει καὶ περὶ ἁφῆς. ὅμως δὲ τὸ κυρίως λεγόμενον ὑπάρχει τοῖς ἔχουσι θέσιν, θέσις δ' οἷσπερ
323[a] καὶ τόπος· καὶ γὰρ τοῖς μαθηματικοῖς ὁμοίως ἀποδοτέον ἁφὴν καὶ τόπον, εἴτ' ἐστὶ κεχωρισμένον ἕκαστον αὐτῶν εἴτ' ἄλλον τρόπον. εἰ οὖν ἐστίν, ὥσπερ διωρίσθη πρότερον, τὸ ἅπτε-

b 8 καὶ τῷ πάσχειν FH 10 οὐδὲ γὰρ διακρίνεσθαι H 12 τῷ] τὸ E καὶ τῷ πάσχειν HJ ὑπ' ἀλλήλων om. EJ καὶ τοῖς] καίτοι (addito supra lin. s) J : γρ. καίτοι add. supra lin. F 14 ἐξ ἑνὸς ἦν ELΦ[1] 15 τὸ prius om. LΦ[1] 16 τοῦτο] τὸ ὕδωρ E 18 ἐστι om. FH τὸ ante πάσχειν om. E 20 εἶναι τοιαῦτα EL 23 οἷόν τε] οἵονται J 24 ἀλλήλων ἅψασθαι F ἁψάμενα ἀλλήλων πως F 25 τριῶν τούτων] τῶν τοιούτων H 27 τῶν ὄντων post μίξις ponit F ὅσοις] οἷς EHΦ[1] 28 ποιεῖ] ποιῇ EFHL πάσχει] πάσχῃ H 31 ὁμονύμως J τῶν om. F a 2 ἐστι] ἔσται L 3 τρόπον ἄλλον EΦ[1]

σθαι τὸ τὰ ἔσχατα ἔχειν ἅμα, ταῦτα ἂν ἅπτοιτο ἀλλήλων ὅσα διῃρημένα μεγέθη καὶ θέσιν ἔχοντα ἅμα ἔχει τὰ ἔσχατα. ἐπεὶ δὲ θέσις μὲν ὅσοις καὶ τόπος ὑπάρχει, τόπου δὲ διαφορὰ πρώτη τὸ ἄνω καὶ τὸ κάτω καὶ τὰ τοιαῦτα τῶν ἀντικειμένων, ἅπαντα τὰ ἀλλήλων ἁπτόμενα βάρος ἂν ἔχοι ἢ κουφότητα, ἢ ἄμφω ἢ θάτερον· τὰ δὲ τοιαῦτα παθητικὰ καὶ ποιητικά· ὥστε φανερὸν ὅτι ταῦτα ἅπτεσθαι πέφυκεν ἀλλήλων, ὧν διῃρημένων μεγεθῶν ἅμα τὰ ἔσχατά ἐστιν, ὄντων κινητικῶν καὶ κινητῶν ὑπ' ἀλλήλων. ἐπεὶ δὲ τὸ κινοῦν οὐχ ὁμοίως κινεῖ τὸ κινούμενον, ἀλλὰ τὸ μὲν ἀνάγκη κινούμενον καὶ αὐτὸ κινεῖν, τὸ δ' ἀκίνητον ὄν, δῆλον ὅτι καὶ ἐπὶ τοῦ ποιοῦντος ἐροῦμεν ὡσαύτως· καὶ γὰρ τὸ κινοῦν ποιεῖν τί φασι καὶ τὸ ποιοῦν κινεῖν. οὐ μὴν ἀλλὰ διαφέρει γε καὶ δεῖ διορίζειν—οὐ γὰρ οἷόν τε πᾶν τὸ κινοῦν ποιεῖν, εἴπερ τὸ ποιοῦν ἀντιθήσομεν τῷ πάσχοντι, τοῦτο δ' οἷς ἡ κίνησις πάθος, πάθος δὲ καθ' ὅσον ἀλλοιοῦται μόνον, οἷον τὸ λευκὸν καὶ τὸ θερμόν, ἀλλὰ τὸ κινεῖν ἐπὶ πλέον τοῦ ποιεῖν ἐστιν—ἐκεῖνο δ' οὖν φανερόν, ὅτι ἔστι μὲν ὡς τὰ κινητικὰ τῶν κινητῶν ἅπτοιτ' ἄν, ἔστι δ' ὡς οὔ. ἀλλ' ὁ διορισμὸς τοῦ ἅπτεσθαι καθόλου μὲν ὁ τῶν θέσιν ἐχόντων καὶ τοῦ μὲν κινητικοῦ τοῦ δὲ κινητοῦ, πρὸς ἄλληλα δέ, κινητικοῦ καὶ κινητοῦ ἐν οἷς ὑπάρχει τὸ ποιεῖν καὶ τὸ πάσχειν. ἔστι μὲν οὖν ὡς ἐπὶ τὸ πολὺ τὸ ἁπτόμενον ἁπτομένου ἁπτόμενον—καὶ γὰρ κινεῖ κινούμενα πάντα σχεδὸν τὰ ἐμποδών, ὅσοις ἀνάγκη καὶ φαίνεται τὸ ἁπτόμενον ἅπτεσθαι ἁπτομένου. ἔστι δ', ὡς ἐνίοτέ φαμεν, τὸ κινοῦν ἅπτεσθαι μόνον τοῦ κινουμένου, τὸ δ' ἁπτόμενον μὴ ἅπτεσθαι ἁπτομένου—ἀλλὰ διὰ τὸ κινεῖν κινούμενα τὰ ὁμογενῆ, ἀνάγκη δοκεῖ

a 4 ἅπτοιντο F 5 διῃρημένα scripsi, cf. 323a 11 : διωρισμένα codd. et Φc ἔχει] ἔχειν L 7 πρώτη post κάτω ponit F τὸ ante κάτω om. EL 8 τὰ om. E ἔχοι] ἔχῃ F 12 κινητῶν καὶ κινητικῶν FHL ἐπεὶ] ἐπὶ E 14 ὄν add. supra lin. J 15 κινοῦν] κινεῖν L 16 ποιοι ν] ποιεῖν L διαφέρει καὶ δεῖ E, sed ει καὶ δεῖ fecit in loco plurium capace 17 τὸ κινοῦν πᾶν FHJ ποιοῦν] ποιεῖν FHJ 19 τὸ utrumque om. J τὸ θερμὸν καὶ τὸ λευκόν F 20 κινεῖν] κινοῦν E πλεῖον H 21 κινητικὰ] ἀκίνητα F : incertum E1 : κινοῦντα LΦ, et fecit E2 : motiva immobilia tangunt Γ κινητῶν] κινουμένων Φ 22 ὡς om. E ὁ post μὲν om. Φ1 (codd. RZ) 24 δέ om. E κινητοῦ καὶ κινητικοῦ EΦ ὑπάρχειν E 25 τὸ post καὶ om. L τὸ post ἐπὶ om. E 27 ὅσοις] οἷς Φ καὶ om. J 28 ἔστι . . . 29 ἁπτομένου om. F 29 μόνον] μόνου F 30 ὁμοιογενῆ EHJ2 δοκεῖ] δοκεῖν EFHL

εἶναι ἁπτομένου ἅπτεσθαι, ὥστε εἴ τι κινεῖ ἀκίνητον ὄν, ἐκεῖνο μὲν ἂν ἅπτοιτο τοῦ κινητοῦ, ἐκείνου δὲ οὐδέν— φαμὲν γὰρ ἐνίοτε τὸν λυποῦντα ἅπτεσθαι ἡμῶν, ἀλλ' οὐκ αὐτοὶ ἐκείνου. περὶ μὲν οὖν ἀφῆς τῆς ἐν τοῖς φυσικοῖς διωρίσθω τοῦτον τὸν τρόπον·
323b περὶ δὲ τοῦ ποιεῖν καὶ πάσχειν λεκτέον ἐφεξῆς. παρει- 7
λήφαμεν δὲ παρὰ τῶν πρότερον ὑπεναντίους ἀλλήλοις λόγους. οἱ μὲν γὰρ πλεῖστοι τοῦτό γε ὁμονοητικῶς λέγουσιν, ὡς τὸ μὲν ὅμοιον ὑπὸ τοῦ ὁμοίου πᾶν ἀπαθές ἐστι διὰ τὸ μηδὲν μᾶλλον ποιητικὸν ἢ παθητικὸν εἶναι θάτερον θατέρου (πάντα γὰρ ὁμοίως ὑπάρχειν ταὐτὰ τοῖς ὁμοίοις), τὰ δ' ἀνόμοια καὶ τὰ διάφορα ποιεῖν καὶ πάσχειν ἄλληλα πέφυκεν· καὶ γὰρ ὅταν τὸ ἔλαττον πῦρ ὑπὸ τοῦ πλείονος φθείρηται, διὰ τὴν ἐναντίωσιν τοῦτό φασι πάσχειν, ἐναντίον γὰρ εἶναι τὸ πολὺ τῷ ὀλίγῳ. Δημόκριτος δὲ παρὰ τοὺς ἄλλους ἰδίως ἔλεξε μόνος· φησὶ γὰρ τὸ αὐτὸ καὶ ὅμοιον εἶναι τό τε ποιοῦν καὶ τὸ πάσχον—οὐ γὰρ ἐγχωρεῖν τὰ ἕτερα καὶ διαφέροντα πάσχειν ὑπ' ἀλλήλων, ἀλλὰ κἂν ἕτερα ὄντα ποιῇ τι ἄλληλα, οὐχ ᾗ ἕτερα ἀλλ' ᾗ ταὐτόν τι ὑπάρχει, ταύτῃ τοῦτο συμβαίνειν αὐτοῖς. τὰ μὲν οὖν λεγόμενα ταῦτ' ἐστίν, ἐοίκασι δὲ οἱ τοῦτον τὸν τρόπον λέγοντες ὑπεναντία φαίνεσθαι λέγειν· αἴτιον δὲ τῆς ἐναντιολογίας ὅτι δέον ὅλον τι θεωρῆσαι μέρος τι τυγχάνουσι λέγοντες ἑκάτεροι. τό τε γὰρ ὅμοιον καὶ τὸ πάντῃ πάντως ἀδιάφορον εὔλογον μὴ πάσχειν ὑπὸ τοῦ ὁμοίου μηθέν (τί γὰρ μᾶλλον ἔσται θάτερον ποιητικὸν ἢ θάτερον; εἴ τε ὑπὸ τοῦ ὁμοίου πάσχειν τι δυνατόν, καὶ αὐτὸ ὑφ' ἑαυτοῦ—καίτοι τούτων οὕτως ἐχόντων οὐδὲν ἂν εἴη οὔτε ἄφθαρτον οὔτε ἀκίνητον, εἴπερ τὸ ὅμοιον ᾗ ὅμοιον ποιητικόν, αὐτὸ γὰρ ἑαυτὸ κινήσει πᾶν), τό τε παντελῶς ἕτερον

a 31 κεῖνο E 32 ἂν om. HJ κείνου E b 2 προτέρων FH ὑπεναντίοις L 5 θατέρου θάτερον J 6 ὑπάρχει FH 7 τὰ om. F πάσχειν εἰς ἄλληλα FL πεφυκέναι EHJ 9 πάσχειν ante τοῦτο ponit E εἶναι post 10 τὸ πολὺ ponit L 11 ἔλεγξεν E, sed γ erasit φασὶν E καὶ om. E 12 ἐγχωρεῖ E 14 τι prius om. L εἰς ἄλληλα FL 15 αὐτοῖς] ἀλλήλοις H ταῦτ'] τοιαῦτα H 16 φαίνεσθαι om. Γ, et (ut videtur) Φc, Vitelli p. 141. 15 18 ἑκάτεροι] ἀμφότεροι F 19 καὶ τὸ] τὸ καὶ τὸ, duabus litteris post καὶ deletis, E 20 γὰρ om. E θάτερον ἔσται FH : ἔσται θατέρου E1 21 ᾗ om. E εἴ τε Bonitz : εἴτε Bekker τι πάσχειν EL 22 αὑτοῦ EHL τούτων] τῶν E οὕτως ἐχόντων] ὄντων οὕτως FHJΓ : οὕτως οὕτως E 23 οὔτε prius] οὐδὲ E 24 ἑαυτὸ] αὐτὸ EL

καὶ τὸ μηθαμῇ ταὐτὸν ὡσαύτως. οὐδὲν γὰρ ἂν πάθοι λευ- 25
κότης ὑπὸ γραμμῆς ἢ γραμμὴ ὑπὸ λευκότητος, πλὴν εἰ
μή που κατὰ συμβεβηκός, οἷον εἰ συμβέβηκε λευκὴν ἢ μέ-
λαιναν εἶναι τὴν γραμμήν· οὐκ ἐξίστησι γὰρ ἑαυτὰ τῆς
φύσεως ὅσα μήτ' ἐναντία μήτ' ἐξ ἐναντίων ἐστίν. ἀλλ' ἐπεὶ
οὐ τὸ τυχὸν πέφυκε πάσχειν καὶ ποιεῖν, ἀλλ' ὅσα ἢ ἐναν- 30
τίωσιν ἔχει ἢ ἐναντία ἐστίν, ἀνάγκη καὶ τὸ ποιοῦν καὶ τὸ
πάσχον τῷ γένει μὲν ὅμοιον εἶναι καὶ ταὐτό, τῷ δ' εἴδει
ἀνόμοιον καὶ ἐναντίον (πέφυκε γὰρ σῶμα μὲν ὑπὸ σώμα-
τος, χυμὸς δ' ὑπὸ χυμοῦ, χρῶμα δ' ὑπὸ χρώματος πά-
σχειν, ὅλως δὲ τὸ ὁμογενὲς ὑπὸ τοῦ ὁμογενοῦς· τούτου δ' 324ª
αἴτιον ὅτι τἀναντία ἐν τῷ αὐτῷ γένει πάντα, ποιεῖ δὲ καὶ πά-
σχει τἀναντία ὑπ' ἀλλήλων), ὥστ' ἀνάγκη πῶς μὲν εἶναι
ταὐτὰ τό τε ποιοῦν καὶ τὸ πάσχον, πῶς δ' ἕτερα καὶ ἀνό-
μοια ἀλλήλοις. ἐπεὶ δὲ τὸ πάσχον καὶ τὸ ποιοῦν τῷ 5
μὲν γένει ταὐτὰ καὶ ὅμοια τῷ δ' εἴδει ἀνόμοια, τοιαῦτα
δὲ τἀναντία, φανερὸν ὅτι παθητικὰ καὶ ποιητικὰ ἀλλήλων
ἐστὶ τά τ' ἐναντία καὶ τὰ μεταξύ—καὶ γὰρ ὅλως φθορὰ
καὶ γένεσις ἐν τούτοις. διὸ καὶ εὔλογον ἤδη τό τε πῦρ θερ-
μαίνειν καὶ τὸ ψυχρὸν ψύχειν, καὶ ὅλως τὸ ποιητικὸν ὁμοι- 10
οῦν ἑαυτῷ τὸ πάσχον. τό τε γὰρ ποιοῦν καὶ τὸ πάσχον ἐναν-
τία ἐστί, καὶ ἡ γένεσις εἰς τοὐναντίον· ὥστ' ἀνάγκη τὸ πάσχον
εἰς τὸ ποιοῦν μεταβάλλειν, οὕτω γὰρ ἔσται εἰς τοὐναντίον ἡ
γένεσις. καὶ κατὰ λόγον δὴ τὸ μὴ ταὐτὰ λέγοντας ἀμφο-
τέρους ὅμως ἅπτεσθαι τῆς φύσεως. λέγομεν γὰρ πάσχειν 15
ὁτὲ μὲν τὸ ὑποκείμενον (οἷον ὑγιάζεσθαι τὸν ἄνθρωπον καὶ
θερμαίνεσθαι καὶ ψύχεσθαι καὶ τἆλλα τὸν αὐτὸν τρόπον),
ὁτὲ δὲ θερμαίνεσθαι μὲν τὸ ψυχρόν, ὑγιάζεσθαι δὲ τὸ κά-

b 25 μηδαμῇ J : μηδαμῶς F λευκ. ὑ. γ.] λευκότητος ὕπο γραμμή E¹ 27 μή που om. EJ μέλεναν E¹: μέλανα F 28 ἑαυτὰ] ἄλληλα EL 29 ἐπειδὴ F 30 πέφυκε] γρ. ἔοικεν in marg. add. E ἢ om. J ἢ ἐναντίωσιν ἔχει post 31 ἢ ἐναντία ἐστίν ponunt FH, et post ἢ ἐναντία L, qui ἐστίν om. 31 καὶ prius om. EL 33 πέφυκε μὲν γὰρ E a 1 ὁμοιογενὲς H ὁμοιογενοῦς EH 2 τῷ αὐτῷ] ταὐτῷ E ποιεῖν δὲ καὶ πάσχειν H 5 ἐπεὶ] ἐπὶ E δὲ καὶ τὸ πάσχον FH 6 καὶ τὰ ὅμοια E 7 ὅτι τὰ παθητικὰ E 10 ὅλως τὸ] ὅλως τι E 11 αὐτῷ E 12 ἡ om. E εἰς om. J 13 ἔσται post 14 γένεσις ponit F 14 δὴ] δὲ E 15 ὅμως J²Φ°Γ: ὁμοίως EFHJ¹L ἅπτεσθαι in litura J 16 ὁτὲ] τότε E οἷον τὸ ὑγιάζεσθαι L καὶ] ἢ καὶ L : καὶ τὸ θερμὸν καὶ E 17 καὶ ψύχεσθαι] τὸν λίθον HΦ°

μνον. ἀμφότερα δ' ἐστὶν ἀληθῆ (τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τοῦ ποιοῦντος, ὁτὲ μὲν γὰρ τὸν ἄνθρωπόν φαμεν θερμαίνειν, ὁτὲ δὲ τὸ θερμόν), ἔστι μὲν γὰρ ὡς ἡ ὕλη πάσχει, ἔστι δ' ὡς τὸ ἐναντίον. οἱ μὲν οὖν εἰς ἐκεῖνο βλέψαντες ταὐτόν τι δεῖν ᾠήθησαν τὸ ποιοῦν ἔχειν καὶ τὸ πάσχον, οἱ δ' εἰς θάτερα τοὐναντίον. τὸν αὐτὸν δὲ λόγον ὑποληπτέον εἶναι περὶ τοῦ ποιεῖν καὶ πάσχειν ὅνπερ καὶ περὶ τοῦ κινεῖσθαι καὶ κινεῖν. διχῶς γὰρ λέγεται καὶ τὸ κινοῦν· ἐν ᾧ τε γὰρ ἡ ἀρχὴ τῆς κινήσεως, δοκεῖ τοῦτο κινεῖν (ἡ γὰρ ἀρχὴ πρώτη τῶν αἰτίων) καὶ πάλιν τὸ ἔσχατον πρὸς τὸ κινούμενον καὶ τὴν γένεσιν. ὁμοίως δὲ καὶ περὶ τοῦ ποιοῦντος· καὶ γὰρ τὸν ἰατρόν φαμεν ὑγιάζειν καὶ τὸν οἶνον. τὸ μὲν οὖν πρῶτον κινοῦν οὐδὲν κωλύει ἐν μὲν κινήσει ἀκίνητον εἶναι (ἐπ' ἐνίων δὲ καὶ ἀναγκαῖον), τὸ δ' ἔσχατον ἀεὶ κινεῖν κινούμενον· ἐπὶ δὲ ποιήσεως τὸ μὲν πρῶτον ἀπαθές, τὸ δ' ἔσχατον καὶ αὐτὸ πάσχον. ὅσα γὰρ μὴ ἔχει τὴν αὐτὴν ὕλην, ποιεῖ ἀπαθῆ ὄντα (οἷον ἡ ἰατρική, αὐτὴ γὰρ ποιοῦσα ὑγίειαν οὐδὲν πά-
324[b] σχει ὑπὸ τοῦ ὑγιαζομένου), τὸ δὲ σιτίον ποιοῦν καὶ αὐτὸ πάσχει τι—ἢ γὰρ θερμαίνεται ἢ ψύχεται ἢ ἄλλο τι πάσχει ἅμα ποιοῦν. ἔστι δὲ ἡ μὲν ἰατρικὴ ὡς ἀρχή, τὸ δὲ σιτίον τὸ ὡς ἔσχατον καὶ ἀπτόμενον. ὅσα μὲν οὖν μὴ ἐν ὕλῃ ἔχει τὴν μορφήν, ταῦτα μὲν ἀπαθῆ τῶν ποιητικῶν, ὅσα δ' ἐν ὕλῃ, παθητικά—τὴν μὲν γὰρ ὕλην λέγομεν ὁμοίως ὡς εἰπεῖν τὴν αὐτὴν εἶναι τῶν ἀντικειμένων ὁποτερουοῦν, ὥσπερ γένος ὄν, τὸ δὲ δυνάμενον θερμὸν εἶναι παρόντος τοῦ θερμαντικοῦ καὶ πλησιάζοντος ἀνάγκη θερμαίνεσθαι. διό, καθάπερ εἴρηται, τὰ μὲν τῶν ποιητικῶν ἀπαθῆ τὰ δὲ παθητικά, καὶ ὥσπερ ἐπὶ κινήσεως τὸν αὐτὸν ἔχει τρόπον καὶ ἐπὶ τῶν ποιητικῶν·

a 20 *τὸν* om. F 21 *ἡ* om. E 22 *τοὐναντίον* E *τι* om. FHJ[2] 23 *θάτερα*] *θἄτερον* F 24 *δὲ λόγον*] *τρόπον* F 25–26 *κινεῖν καὶ κινεῖσθαι* EL 26 *ἡ* om. E 27 *ἡ γὰρ* om. E 28 *τὸ ἔσχατον . . .* 29 *γένεσιν*] ultimum aliquid id quod movetur ad generationem Γ 30 *κινοῦν* om. E 31 *μὲν*] *μὲν οὖν* E : *μὲν τῇ* F 32 *τὸ*] *τῷ* E[1] : *τὸν* F *ἐπὶ*] *ἐπεὶ* E 34 *ἔχει*] *πάσχει* E : *ἔχῃ* J 35 *αὐτὴ*] *αὕτη* FHJL b 1 *τὸ ποιοῦν* FHJ 2 *τι* prius om. F *τι . . . θερμαίνεται* in litura J *ἢ ψύχεται* om. E 3 *σιτίον τὸ ὡς ἔσχατον*] *ἔσχατον τὸ σιτίον* F (sed post *σιτίον* erasum habet *ὡς ἔσχατον*) : *σιτίον τὸ ἔσχατον* E 5 *μὲν οὖν ἀπαθῆ* E 6 *ὁμοίως* delendum notat J *τὴν αὐτὴν ὡς εἰπεῖν* F 7 *ὁποτερονοῦν* E : *ὁποτερωνοῦν* HJ[2] *ὄν* delendum notat J 8 *θερμαντικοῦ*] *θερμοῦ* H 11 *τρόπον ἔχει* F

ἐκεῖ τε γὰρ τὸ πρῶτον κινοῦν ἀκίνητον, καὶ ἐπὶ τῶν ποιητικῶν τὸ πρῶτον ποιοῦν ἀπαθές. ἔστι δὲ τὸ ποιητικὸν αἴτιον ὡς ὅθεν ἡ ἀρχὴ τῆς κινήσεως. τὸ δ' οὗ ἕνεκα οὐ ποιητικόν (διὰ ἡ ὑγίεια οὐ ποιητικόν, εἰ μὴ κατὰ μεταφοράν)· καὶ γὰρ τοῦ μὲν ποιοῦντος ὅταν ὑπάρχῃ, γίγνεταί τι τὸ πάσχον, τῶν δ' ἕξεων παρουσῶν οὐκέτι γίνεται, ἀλλ' ἔστιν ἤδη, τὰ δ' εἴδη καὶ τὰ τέλη ἕξεις τινές. ἡ δ' ὕλη ᾗ ὕλη παθητικόν./ τὸ μὲν οὖν πῦρ ἔχει ἐν ὕλῃ τὸ θερμόν· εἰ δέ τι εἴη θερμὸν χωριστόν, τοῦτο οὐθὲν ἂν πάσχοι. τοῦτο μὲν οὖν ἴσως ἀδύνατον εἶναι χωριστόν—εἰ δ' ἐστὶν ἕνια τοιαῦτα, ἐπ' ἐκείνων ἂν εἴη τὸ λεγόμενον ἀληθές. τί μὲν οὖν τὸ ποιεῖν καὶ πάσχειν ἐστὶ καὶ τίσιν ὑπάρχει καὶ διὰ τί καὶ πῶς, διωρίσθω τοῦτον τὸν τρόπον·

8 πῶς δὲ ἐνδέχεται τοῦτο συμβαίνειν, πάλιν λέγωμεν. τοῖς μὲν οὖν δοκεῖ πάσχειν ἕκαστον διά τινων πόρων εἰσιόντος τοῦ ποιοῦντος ἐσχάτου καὶ κυριωτάτου, καὶ τοῦτον τὸν τρόπον καὶ ὁρᾶν καὶ ἀκούειν ἡμᾶς φασι καὶ τὰς ἄλλας αἰσθήσεις αἰσθάνεσθαι πάσας· ἔτι δὲ ὁρᾶσθαι διά τε ἀέρος καὶ ὕδατος καὶ τῶν διαφανῶν, διὰ τὸ πόρους ἔχειν ἀοράτους μὲν διὰ μικρότητα, πυκνοὺς δὲ καὶ κατὰ στοῖχον, καὶ μᾶλλον ἔχειν τὰ διαφανῆ μᾶλλον. οἱ μὲν οὖν ἐπί τινων οὕτω διώρισαν, ὥσπερ καὶ Ἐμπεδοκλῆς, οὐ μόνον ἐπὶ τῶν ποιούντων καὶ πασχόντων, ἀλλὰ καὶ μίγνυσθαί φασιν ὅσων οἱ πόροι σύμμετροι πρὸς ἀλλήλους εἰσίν· ὁδῷ δὲ μάλιστα καὶ περὶ πάντων ἐνὶ λόγῳ διωρίκασι Λεύκιππος καὶ Δημόκριτος, ἀρ- 325ª
χὴν ποιησάμενοι κατὰ φύσιν ἥπερ ἐστίν. ἐνίοις γὰρ τῶν ἀρχαίων ἔδοξε τὸ ὂν ἐξ ἀνάγκης ἓν εἶναι καὶ ἀκίνητον· τὸ

b 12 *πρώτως* FL 13 *τὸ . . . ἀπαθές* delenda notat J *πρώτως* FL *τὸ μὲν ποιητικὸν* L 15 *ἡ* om. F 16 *ὅταν γὰρ ὑπάρχῃ* E *τι* delendum notat J 17 *ἤδη*] *εἴδη* EF¹ 18 *τὰ* om. F *ᾗ ὕλη* om. Φᶜ *τὸ παθητικόν* F 19 *χωριστὸν θερμὸν εἴη* F : *εἴη χωριστὸν θερμόν* HJ 20 *ἂν* om. F 21 *ἐστὶν* om. H 22 *καὶ τὸ πάσχειν* HΦ¹ 23 *ὑπάρχειν* F 25 *λέγομεν* HJ 26 *ἕκαστον* post *πόρων* ponit L 27 fort. *τοῦ ἐσχάτου* legendum 28 *καὶ* primum om. EFL 29 *δὲ* om. F 30 *καὶ*] *τε καὶ διὰ* F *μὲν* om. E 31 *σμικρότητα* FHL *στοῖχον*] *στοιχεῖον* F¹J *καὶ τὰ μᾶλλον* J 32 *ἔχειν* om. J *τινων*] *τινος* F *οὕτως διώρησαν* J 34 *φασιν*] *φησιν* JL *ὅσων*] *ὧν* FL : om. E 35 *σύμμετροι* post *εἰσίν* ponit F *εἰσίν* om. L a 1 *ἐνὶ λόγῳ* om. EΦ¹, et delenda notat J 2 fort. legendum *ᾗπερ ἔστιν*, cf. Parmenides fr. 8, vv. 1 et 2 (Diels, p. 118) 3 *ἐξ ἀνάγκης* delenda notat J

μὲν γὰρ κενὸν οὐκ ὄν, κινηθῆναι δ' οὐκ ἂν δύνασθαι μὴ ὄντος κενοῦ κεχωρισμένου, οὐδ' αὖ πολλὰ εἶναι μὴ ὄντος τοῦ διείργοντος—τοῦτο δ' οὐδὲν διαφέρειν, εἴ τις οἴεται μὴ συνεχὲς εἶναι τὸ πᾶν ἀλλ' ἅπτεσθαι διῃρημένον, τοῦ φάναι πολλὰ καὶ μὴ ἓν εἶναι καὶ κενόν. εἰ μὲν γὰρ πάντῃ διαιρετόν, οὐθὲν εἶναι ἕν, ὥστε οὐδὲ πολλά, ἀλλὰ κενὸν τὸ ὅλον· εἰ δὲ τῇ μὲν τῇ δὲ μή, πεπλασμένῳ τινὶ τοῦτ' ἐοικέναι. μέχρι πόσου γάρ, καὶ διὰ τί τὸ μὲν οὕτως ἔχει τοῦ ὅλου καὶ πλῆρές ἐστι, τὸ δὲ διῃρημένον; ἔτι δ' ὁμοίως ἀναγκαῖον μὴ εἶναι κίνησιν. ἐκ μὲν οὖν τούτων τῶν λόγων ὑπερβάντες τὴν αἴσθησιν καὶ παριδόντες αὐτὴν ὡς τῷ λόγῳ δέον ἀκολουθεῖν ἓν καὶ ἀκίνητον τὸ πᾶν εἶναί φασι καὶ ἄπειρον ἔνιοι· τὸ γὰρ πέρας περαίνειν ἂν πρὸς τὸ κενόν. οἱ μὲν οὖν οὕτως καὶ διὰ ταύτας τὰς αἰτίας ἀπεφήναντο περὶ τῆς ἀληθείας * * * *. ἔτι δὲ ἐπὶ μὲν τῶν λόγων δοκεῖ ταῦτα συμβαίνειν, ἐπὶ δὲ τῶν πραγμάτων μανίᾳ παραπλήσιον εἶναι τὸ δοξάζειν οὕτως· οὐδένα γὰρ τῶν μαινομένων ἐξεστάναι τοσοῦτον ὥστε τὸ πῦρ ἓν εἶναι δοκεῖν καὶ τὸν κρύσταλλον, ἀλλὰ μόνον τὰ καλὰ καὶ τὰ φαινόμενα διὰ συνήθειαν, ταῦτ' ἐνίοις διὰ τὴν μανίαν οὐθὲν δοκεῖ διαφέρειν. Λεύκιππος δ' ἔχειν ᾠήθη λόγους, οἵτινες πρὸς τὴν αἴσθησιν ὁμολογούμενα λέγοντες οὐκ ἀναιρήσουσιν οὔτε γένεσιν οὔτε φθορὰν οὔτε κίνησιν καὶ τὸ πλῆθος τῶν ὄντων. ὁμολογήσας δὲ ταῦτα μὲν τοῖς φαινομένοις, τοῖς δὲ τὸ ἓν κατασκευάζουσιν ὡς οὐκ ἂν κίνησιν οὖσαν ἄνευ κενοῦ, τό τε κενὸν μὴ ὂν καὶ τοῦ ὄντος οὐθὲν μὴ ὄν φησιν εἶναι· τὸ γὰρ κυρίως ὂν παμπλῆρες ὄν. ἀλλ' εἶναι τὸ τοιοῦτον οὐχ ἕν, ἀλλ' ἄπειρα τὸ πλῆθος καὶ ἀόρατα διὰ σμικρότητα τῶν ὄγκων. ταῦτα δ' ἐν τῷ κενῷ φέρεσθαι (κενὸν γὰρ εἶναι), καὶ συνιστάμενα μὲν γένεσιν ποιεῖν, διαλυόμενα δὲ φθοράν. ποιεῖν

a 6 δ' οὐδὲν] δὲ μηδὲν EL εἴ] ἢ εἰ F¹L : ut si Γ 8 ἓν om. E γὰρ] παρὰ J 10 τοῦτ' ἂν ἐοικέναι F : τοῦτο ἂν ἔοικε L 12 δ' post ἔτι om. E ὁμοίως φάναι ἀναγκαῖον FHL 13 ὑπερβαίνοντες EL 14 ὑπεριδόντες HJ : despicientes Γ 16 ἂν om. L οὖν om. E 17 post ἀληθείας excidisse quaedam suspicor ἔτι] ἐπεὶ L μὲν post 18 λόγων ponunt EΦ¹ 19 εἶναι] ἐστι FHJ 20 ἓν om. E 21 κρύσταλον J 22 διὰ τὴν συνήθειαν F² 23 ᾠήθη ἔχειν F 27 οὐκ] οὔτε FHJL τό τε] ποιεῖν E : ποιεῖν το δὲ F² (ποιεῖν addito, et το δὲ ex τό τε facto) 28 γὰρ om. EJ 29 ὂν prius] ἓν EJ παμπλῆρες J : πᾶν πλῆρες H : παμπληθὲς (ut videtur) L ὄν secundum om. J τὸ om. H 30 καὶ . . . ὄγκων in litura addit E rc. manu : καὶ ἀόρατα post ὄγκων ponit L μικρότητα J 32 δὲ om. E

δὲ καὶ πάσχειν ἢ τυγχάνουσιν ἀπτόμενα (ταύτῃ γὰρ οὐχ ἓν εἶναι), καὶ συντιθέμενα δὲ καὶ περιπλεκόμενα γεννᾶν. ἐκ δὲ τοῦ κατ' ἀλήθειαν ἑνὸς οὐκ ἂν γενέσθαι πλῆθος οὐδ' ἐκ τῶν ἀληθῶς πολλῶν ἕν, ἀλλ' εἶναι τοῦτ' ἀδύνατον· ἀλλ', ὥσπερ Ἐμπεδοκλῆς καὶ τῶν ἄλλων τινές φασι πάσχειν 325ᵇ διὰ τῶν πόρων, οὕτω πᾶσαν ἀλλοίωσιν καὶ πᾶν τὸ πάσχειν τοῦτον γίνεσθαι τὸν τρόπον, διὰ τοῦ κενοῦ γινομένης τῆς διαλύσεως καὶ τῆς φθορᾶς, ὁμοίως δὲ καὶ τῆς αὐξήσεως, ὑπεισδυομένων στερεῶν. σχεδὸν δὲ καὶ Ἐμπεδοκλεῖ ἀναγκαῖον λέγειν ὥσπερ καὶ Λεύκιππός φησιν· εἶναι γὰρ ἄττα στερεά, ἀδιαίρετα δέ, εἰ μὴ πάντῃ πόροι συνεχεῖς εἰσιν. τοῦτο δ' ἀδύνατον, οὐθὲν γὰρ ἔσται ἕτερον στερεὸν παρὰ τοὺς πόρους, ἀλλὰ πᾶν κενόν. ἀνάγκη ἄρα τὰ μὲν ἀπτόμενα εἶναι ἀδιαίρετα, τὰ δὲ μεταξὺ αὐτῶν κενά, οὓς ἐκεῖνος λέγει πόρους· οὕτως δὲ καὶ Λεύκιππος λέγει περὶ τοῦ ποιεῖν καὶ πάσχειν. οἱ μὲν οὖν τρόποι καθ' οὓς τὰ μὲν ποιεῖ τὰ δὲ πάσχει σχεδὸν οὗτοι λέγονται. καὶ περὶ μὲν τούτων, καὶ πῶς λέγουσι, δῆλον, καὶ πρὸς τὰς αὐτῶν θέσεις αἷς χρῶνται σχεδὸν ὁμολογουμένως φαίνεται συμβαῖνον· τοῖς δ' ἄλλοις ἧττον, οἷον Ἐμπεδοκλεῖ τίνα τρόπον ἔσται φθορὰ καὶ ἀλλοίωσις οὐ δῆλον. τοῖς μὲν γάρ ἐστιν ἀδιαίρετα τὰ πρῶτα τῶν σωμάτων, σχήματι διαφέροντα μόνον, ἐξ ὧν πρώτων σύγκειται καὶ εἰς ἃ ἔσχατα διαλύεται· Ἐμπεδοκλεῖ δὲ τὰ μὲν ἄλλα φανερὸν ὅτι μέχρι τῶν στοιχείων ἔχει τὴν γένεσιν καὶ τὴν φθοράν, αὐτῶν δὲ τούτων πῶς γίνεται καὶ φθείρεται τὸ σωρευόμενον μέγεθος, οὔτε δῆλον οὔτε ἐνδέχεται λέγειν αὐτῷ μὴ λέγοντι καὶ τοῦ πυρὸς εἶναι στοιχεῖον, ὁμοίως δὲ καὶ τῶν ἄλλων ἁπάντων, ὥσπερ ἐν τῷ Τιμαίῳ γέγραφε Πλάτων. τοσοῦτον γὰρ διαφέρει τοῦ μὴ τὸν αὐτὸν

a 33 τυγχάνει F 34 καὶ prius om. L b 2 τῶν om. EL 4 φθορᾶς] φορᾶς J εἰσδυομένων EJ : ὑποδυομένων F 5 στερεῶν FΓ : ἑτέρων EHJL 6 φασιν F ἄττα] αὐτὰ J 7 καὶ post στερεά add. E πόροις L 8 ἔσται om. F ἕτερον om. EL 15 οἷον . . . 17 γάρ om. F, sed in margine addit οἷον Ἐμπεδοκλεῖ τίνα τρόπον ἔσται φθορὰ καὶ γένεσις οὐ δῆλον. τοῖς μὲν γάρ, et inter plura incerta habere videtur etiam ἀλλοίωσις 16 τίνα] ἢ εἰ τίνα H ἔσται φθορὰ EHJL : ἔσται γένεσις καὶ φθορὰ Bekker, qui haec verba libris FH perperam attribuit 17 ἐστιν] ἔσται J² τὰ om. E 18 πρώτων] πρῶτον F 19 διαλύονται EJ 22 οὔτε secundum] οὐκ L

τρόπον Λεύκιππῳ λέγειν, ὅτι ὁ μὲν στερεὰ ὁ δ' ἐπίπεδα λέγει τὰ ἀδιαίρετα, καὶ ὁ μὲν ἀπείροις ὡρίσθαι σχήμασι [τῶν ἀδιαιρέτων στερεῶν ἕκαστον] ὁ δὲ ὡρισμένοις, ἐπεὶ ἀδιαίρετά γε ἀμφότεροι λέγουσι καὶ ὡρισμένα σχήμασιν. ἐκ δὴ τούτων αἱ γενέσεις καὶ αἱ διακρίσεις Λευκίππῳ μὲν [δύο τρόποι ἂν εἶεν,] διά τε τοῦ κενοῦ καὶ διὰ τῆς ἁφῆς (ταύτῃ γὰρ διαιρετὸν ἕκαστον), Πλάτωνι δὲ κατὰ τὴν ἁφὴν μόνον· κενὸν γὰρ οὐκ εἶναί φησιν. καὶ περὶ μὲν τῶν ἀδιαιρέτων ἐπιπέδων εἰρήκαμεν ἐν τοῖς πρότερον λόγοις· περὶ δὲ τῶν ἀδιαιρέτων στερεῶν τὸ μὲν ἐπὶ πλέον θεωρῆσαι τὸ συμβαῖνον ἀφείσθω τὸ νῦν, ὡς δὲ μικρὸν παρεκβᾶσιν εἰπεῖν, ἀναγ-
326ᵃ καῖον ἁπαθές τε ἕκαστον λέγειν τῶν ἀδιαιρέτων (οὐ γὰρ οἷόν τε πάσχειν ἀλλ' ἢ διὰ τοῦ κενοῦ) καὶ μηθενὸς ποιητικὸν πάθους—οὔτε γὰρ σκληρὸν οὔτε ψυχρὸν οἷόν τ' εἶναι. καίτοι τοῦτό γε ἄτοπον, τὸ μόνον ἀποδοῦναι τῷ περιφερεῖ σχήματι τὸ θερμόν· ἀνάγκη γὰρ καὶ τοὐναντίον τὸ ψυχρὸν ἄλλῳ τινὶ προσήκειν τῶν σχημάτων. ἄτοπον δὲ κἂν εἰ ταῦτα μὲν ὑπάρχει, λέγω δὲ θερμότης καὶ ψυχρότης, βαρύτης δὲ καὶ κουφότης καὶ σκληρότης καὶ μαλακότης μὴ ὑπάρξει· καίτοι βαρύτερόν γε κατὰ τὴν ὑπεροχήν φησιν εἶναι Δημόκριτος ἕκαστον τῶν ἀδιαιρέτων, ὥστε δῆλον ὅτι καὶ θερμότερον. τοιαῦτα δ' ὄντα μὴ πάσχειν ὑπ' ἀλλήλων ἀδύνατον, οἷον ὑπὸ τοῦ πολὺ ὑπερβάλλοντος θερμοῦ τὸ ἠρέμα θερμόν. ἀλλὰ μὴν εἰ σκληρόν, καὶ μαλακόν.· τὸ δὲ μαλακὸν ἤδη τῷ πάσχειν τι λέγεται· τὸ γὰρ ὑπεικτικὸν μαλακόν. ἀλλὰ μὴν ἄτοπον καὶ εἰ μηθὲν ὑπάρχει ἀλλ' ἢ μόνον σχῆμα, καὶ εἰ ὑπάρχει, ἓν δὲ μόνον, οἷον τὸ μὲν ψυχρὸν τὸ δὲ θερμόν· οὐδὲ γὰρ ἂν μία τις εἴη ἡ φύσις αὐτῶν. ὁμοίως δὲ ἀδύνατον καὶ εἰ πλείω τῷ ἑνί· ἀδιαίρετον γὰρ ὂν ἐν τῷ

b 28 *τῶν . . . ἕκαστον* seclusi 30 *αἱ* ante *διακρίσεις* om. F post *διακρίσεις* distinxit J *μὲν*] quidem enim Γ *δύο τρόποι ἂν εἶεν* seclusi 31 *τρόποι* J *εἶεν ἄν* F 32 *ἀδιαίρετον* HΦ¹Γ *πλάτων* H 34–35 *περὶ δὲ τῶν στερεῶν τῶν ἀδιαιρέτων* J 35 *πλεῖον* HJ *θεωρεῖσθαι* F 36 *ἀφήσθω* J *τό*] *τὰ* H *εἰπεῖν*] *επει* E
a 2 *ἢ*] *ᾗ* J 3 *σκληρὸν*] calidum Γ *ψυχρὸν οὔτε σκληρὸν* EL *οἷόν τ'*] *δεῖ* F *καίτοι γε τοῦτο* F 7 *ὑπάρχη* FHL: *ὑπάρχηι* J *δὲ* secundum om. J 8 *σκληρότης καὶ κουφότης* F *ὑπάρξηι* J: *ὑπάρξη* L 12 *θερμόν* FΦ^cΓ: *ψυχρόν* EHJL 13 *ἤδη* om. EL 14 *γὰρ*] *δ'* F *ὑπεκτικὸν* J 15 *ἢ* om. EΦ¹ 16 *ψυχρὸν*] *σκληρὸν* EHLΦ¹ 17 *ἡ* om. EFL 18 *εἰ* om. FJ

αὐτῷ ἕξει τὰ πάθη, ὥστε καὶ ἐὰν πάσχῃ ἥπερ ψύχεται, ταύτῃ τι καὶ ἄλλο ποιήσει ἢ πείσεται. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων παθημάτων· τοῦτο γὰρ καὶ τοῖς στερεὰ καὶ τοῖς ἐπίπεδα λέγουσιν ἀδιαίρετα συμβαίνει τὸν αὐτὸν τρόπον, οὔτε γὰρ μανότερα οὔτε πυκνότερα οἷόν τε γίνεσθαι κενοῦ μὴ ὄντος ἐν τοῖς ἀδιαιρέτοις. ἔτι δ' ἄτοπον καὶ τὸ μικρὰ μὲν ἀδιαίρετα εἶναι, μεγάλα δὲ μή. νῦν μὲν γὰρ εὐλόγως τὰ μείζω θραύεται μᾶλλον τῶν μικρῶν· τὰ μὲν γὰρ διαλύεται ῥᾳδίως, οἷον τὰ μεγάλα, προσκόπτει γὰρ πολλοῖς, τὸ δὲ ἀδιαίρετον ὅλως διὰ τί μᾶλλον ὑπάρχει τῶν μεγάλων τοῖς μικροῖς; ἔτι δὲ πότερον μία πάντων ἡ φύσις ἐκείνων τῶν στερεῶν, ἢ διαφέρει θάτερα τῶν ἑτέρων, ὥσπερ ἂν εἰ τὰ μὲν εἴη πύρινα, τὰ δὲ γῆϊνα τὸν ὄγκον; εἰ μὲν γὰρ μία φύσις ἐστὶν ἁπάντων, τί τὸ χωρίσαν; ἢ διὰ τί οὐ γίγνεται ἀψάμενα ἕν, ὥσπερ ὕδωρ ὕδατος ὅταν θίγῃ; οὐδὲν γὰρ διαφέρει τὸ ὕστερον τοῦ προτέρου. εἰ δ' ἕτερα, ποῖα ταῦτα; καὶ δῆλον ὡς ταῦτα θετέον ἀρχὰς καὶ αἰτίας τῶν συμβαινόντων μᾶλλον ἢ τὰ σχήματα. ἔτι δὲ διαφέροντα 326b τὴν φύσιν κἂν ποιοῖ κἂν πάσχοι θιγγάνοντα ἀλλήλων. ἔτι δὲ τί τὸ κινοῦν; εἰ μὲν γὰρ ἕτερον, παθητικά· εἰ δ' αὐτὸ αὑτὸ ἕκαστον, ἢ διαιρετὸν ἔσται, κατ' ἄλλο μὲν κινοῦν κατ' ἄλλο δὲ κινούμενον, ἢ κατὰ ταὐτὸ τἀναντία ὑπάρξει, καὶ ἡ ὕλη οὐ μόνον ἀριθμῷ ἔσται μία ἀλλὰ καὶ δυνάμει. ὅσοι μὲν οὖν διὰ τῆς τῶν πόρων κινήσεως φασι τὰ πάθη συμβαίνειν, εἰ μὲν καὶ πεπληρωμένων τῶν πόρων, περίεργον οἱ πόροι· εἰ γὰρ ταύτῃ πάσχει τι τὸ πᾶν, κἂν μὴ πόρους ἔχον ἀλλ' αὐτὸ συνεχὲς ὂν πάσχοι τὸν αὐτὸν τρόπον. ἔτι

a 19 ἥπερ ψύχεται H : ἡ περιψύχεται F : εἴπερ ψύχεται EJL : secundum quod infrigidatur Γ 20 ταύτῃ τι J : ταύτῃ τι EL : ταύτῃ τοι F : ταύτο τι H : hoc aliquid Γ : ταὐτῷ τοι Bekker, qui ταὐτῷ codd. omnibus perperam tribuit post ἄλλο add. τι L 22 στερεὰ] ἕτερα (ut videtur) E1 23 μανώτερα F γενέσθαι F 26 μείζω] μεγάλα E μᾶλλον om. F 27 ῥᾳδίως τῶν μικρῶν οἷον F προκόπτει FJ 28 τὰ δὲ ἀδιαίρετα L 29 μεγάλων] ἄλων E 30 ἡ om. EΦ1 τῶν στερεῶν ἐκείνων L 32 ἐστὶν om. EL 34 προτέρου] πρότερον EJ1L 35 ταῦτα prius] τοιαῦτα F ταῦτα secundum] ταύτας EJ, fort. recte b 2 ποιῇ κἂν πάσχῃ FL 3 δὲ τί om. E1 παθητικόν F 5 κατὰ ταὐτὸ] κατ' αὐτὸ E 7 κινήσεως] τρήσεως coni. Prantl, sed nihil mutandum 8 καὶ om. L 9 τι πάσχει E : τι om. L τὸ om. L 10 πάσχοι] πάσχει FL

δὲ πῶς ἐνδέχεται περὶ τοῦ διορᾶν συμβαίνειν ὡς λέγουσιν; οὔτε γὰρ κατὰ τὰς ἀφὰς ἐνδέχεται διιέναι διὰ τῶν διαφανῶν, οὔτε διὰ τῶν πόρων, εἰ πλήρης ἕκαστος· τί γὰρ διοίσει τοῦ μὴ πόρους ἔχειν; πᾶν γὰρ ὁμοίως ἔσται πλῆρες. ἀλλὰ μὴν εἰ καὶ κενὰ μὲν ταῦτα, ἀνάγκη δὲ σώματα ἐν αὐτοῖς ἔχειν, ταὐτὸ συμβήσεται πάλιν. εἰ δὲ τηλικαῦτα τὸ μέγεθος ὥστε μὴ δέχεσθαι σῶμα μηδέν, γελοῖον τὸ μικρὸν μὲν οἴεσθαι κενὸν εἶναι, μέγα δὲ μὴ μηδ' ὁπηλικονοῦν, ἢ τὸ κενὸν ἄλλο τι οἴεσθαι λέγειν πλὴν χώραν σώματος, ὥστε δῆλον ὅτι παντὶ σώματι τὸν ὄγκον ἴσον ἔσται κενόν. ὅλως δὲ τὸ πόρους ποιεῖν περίεργον. εἰ μὲν γὰρ μηδὲν ποιεῖ κατὰ τὴν ἀφήν, οὐδὲ διὰ τῶν πόρων ποιήσει διιόν· εἰ δὲ τῷ ἅπτεσθαι, καὶ μὴ πόρων ὄντων τὰ μὲν πείσεται τὰ δὲ ποιήσει τῶν πρὸς ἄλληλα τοῦτον τὸν τρόπον πεφυκότων. ὅτι μὲν οὖν οὕτως λέγειν τοὺς πόρους ὥς τινες ὑπολαμβάνουσιν, ἢ ψεῦδος ἢ μάταιον, φανερὸν ἐκ τούτων ἐστίν. διαιρετῶν δ' ὄντων πάντῃ τῶν σωμάτων πόρους ποιεῖν γελοῖον—ᾗ γὰρ διαιρετά, δύναται χωρίζεσθαι.

Τίνα δὲ τρόπον ὑπάρχει τοῖς οὖσι γεννᾶν καὶ ποιεῖν καὶ 9
πάσχειν, λέγωμεν λαβόντες ἀρχὴν τὴν πολλάκις εἰρημένην. εἰ γάρ ἐστι τὸ μὲν δυνάμει τὸ δ' ἐντελεχείᾳ τοιοῦτον, πέφυκεν οὐ τῇ μὲν τῇ δ' οὔ πάσχειν, ἀλλὰ πάντῃ καθ' ὅσον ἐστὶ τοιοῦτον, ἧττον δὲ καὶ μᾶλλον ᾗ τοιοῦτον μᾶλλόν ἐστι καὶ ἧττον· καὶ ταύτῃ πόρους ἄν τις λέγοι μᾶλλον, καθάπερ ἐν τοῖς μεταλλευομένοις διατείνουσι τοῦ παθητικοῦ φλέβες
327[a] συνεχεῖς. συμφυὲς μὲν οὖν ἕκαστον καὶ ἓν ὃν ἀπαθές· ὁμοίως δὲ καὶ μὴ θιγγάνοντα μήτε αὐτῶν μήτ' ἄλλων, ἃ ποιεῖν πέφυκε καὶ πάσχειν (λέγω δ' οἷον οὐ μόνον ἁπτόμενον θερμαίνει τὸ πῦρ, ἀλλὰ κἂν ἄποθεν ᾗ—τὸν μὲν γὰρ ἀέρα τὸ πῦρ, ὁ δ' ἀὴρ τὸ σῶμα θερμαίνει, πεφυκὼς καὶ ποιεῖν καὶ

b 11 περὶ . . . 12 ἐνδέχεται in marg. add. F 12 διεῖναι E 14 ἔχειν πόρους EL πᾶν] πάλιν J ἔσται] ἐστὶν E 15 καὶ om. EFΦ[1] 16 αὐτοῖς FHJLΦ[1]Γ 18 μέγα ante κενὸν ponit F 20 ἔσται κενὸν ἴσον H 21 ποιεῖ . . . 22 πόρων om. E[1] 22 δὲ καὶ τῷ E 26 ἐστὶ ante φανερὸν ponit F 27 ὄντων post σωμάτων ponit F 29 τοῖς οὖσιν ὑπάρχει J γεννᾶν τοῖς οὖσι F καὶ ante ποιεῖν delendum notat J 30 εἰρημένην πολλάκις F 31 τοιοῦτον] τοῦτο J πέφυκεν in marg. add. F 32 πάντως H 34 ἄν] εἰ E λέγοι] λέγη L: om. E μᾶλλον ᾗ καθάπερ EFJ
a 2 αὐτῶν JΦ[1] 4 θερμαίνειν EJ[2] ἄποθεν EJ 5 ἀὴρ καὶ τὸ E πεφυκὸς J καὶ ante ποιεῖν om. EL

πάσχειν). τὸ δὲ τῇ μὲν οἴεσθαι πάσχειν τῇ δὲ μή * * * διορίσαντας ἐν ἀρχῇ τοῦτο λεκτέον. εἰ μὲν γὰρ μὴ πάντῃ διαιρετὸν τὸ μέγεθος, ἀλλ' ἔστι σῶμα ἀδιαίρετον ἢ πλάτος, οὐκ ἂν εἴη πάντῃ παθητικόν, ἀλλ' οὐδὲ συνεχὲς οὐδέν· εἰ δὲ τοῦτο ψεῦδος καὶ πᾶν σῶμα διαιρετόν, οὐδὲν διαφέρει διῃ- 10
ρῆσθαι μὲν ἅπτεσθαι δέ, ἢ διαιρετὸν εἶναι. εἰ γὰρ διακρίνεσθαι δύναται κατὰ τὰς ἁφάς, ὥσπερ φασί τινες, κἂν μήπω ᾖ διῃρημένον, ἔσται διῃρημένον· δυνατὸν γὰρ διαιρεθῆναι, γίνεται γὰρ οὐθὲν ἀδύνατον. ὅλως δὲ τὸ τοῦτον γίνεσθαι τὸν τρόπον μόνον σχιζομένων τῶν σωμάτων ἄτοπον. ἀναιρεῖ 15
γὰρ οὗτος ὁ λόγος ἀλλοίωσιν, ὁρῶμεν δὲ τὸ αὐτὸ σῶμα συνεχὲς ὂν ὁτὲ μὲν ὑγρὸν ὁτὲ δὲ πεπηγός, οὐ διαιρέσει καὶ συνθέσει τοῦτο παθόν, οὐδὲ τροπῇ καὶ διαθιγῇ, καθάπερ λέγει Δημόκριτος—οὔτε γὰρ μεταταχθὲν οὔτε μετατεθὲν τὴν φύσιν πεπηγὸς ἐξ ὑγροῦ γέγονεν, οὐδ' ἐνυπάρχει τὰ 20
σκληρὰ καὶ πεπηγότα ἀδιαίρετα τοὺς ὄγκους, ἀλλ' ὁμοίως ἅπαν ὑγρόν, ὁτὲ δὲ σκληρὸν καὶ πεπηγός ἐστιν. ἔτι δ' οὐδ' αὔξησιν οἷόν τ' εἶναι καὶ φθίσιν· οὐ γὰρ ὁτιοῦν ἔσται γεγονὸς μεῖζον, εἴπερ ἔσται πρόσθεσις, καὶ μὴ πᾶν μεταβεβληκὸς ἢ μιχθέντος τινὸς ἢ καθ' αὑτὸ μεταβάλλοντος. ὅτι 25
μὲν οὖν ἔστι τὸ γενναῖν καὶ τὸ ποιεῖν καὶ τὸ γίγνεσθαί τε καὶ πάσχειν ὑπ' ἀλλήλων, καὶ τίνα τρόπον ἐνδέχεται, καὶ τίνα φασὶ μέν τινες οὐκ ἐνδέχεται δέ, διωρίσθω τοῦτον τὸν τρόπον·

10 λοιπὸν δὲ θεωρῆσαι περὶ μίξεως κατὰ τὸν αὐτὸν τρό- 30
πον τῆς μεθόδου, τοῦτο γὰρ ἦν τρίτον τῶν προτεθέντων ἐξ ἀρχῆς. σκεπτέον δὲ τί τ' ἐστὶν ἡ μίξις καὶ τί τὸ μικτόν,

a 6 post μή excidisse quaedam suspicor 7 τὸ ἐν ἀρχῇ (ut videtur) Γ πάντῃ] παντὶ E 8 σῶμα μὲν ἀδιαίρετον H 9 οὐδέν ante οὐδὲ ponit F 13 ἔσται διῃρημένον om. F, et delenda notat H γὰρ om. F 14 τὸ om. E, et delendum notat J 15 μόνον om. FLΓ 16 ὁ λόγος οὗτος H: οὗτος ὁ τρόπος F 18 καὶ διαθιγῇ om. E: καὶ διαθηγῇ L (cf. supra, 315b 35) λέγει] φησὶ F 19 οὔτε γὰρ . . . 20 φύσιν] neque enim transductum neque transpositum secundum naturam neque transmissum Γ 19 μεταταχθὲν οὔτε μετατεθὲν] μετατεθὲν οὔτε μεταβαλὸν L: μετατεθὲν E: μετατεθὲν τὴν φύσιν οὔτε μεταβαλὸν F τὴν φύσιν] τῇ φύσει H 20 οὐδ' ἐνυπάρχει] οὐδὲ νῦν ὑπάρχει E¹LΓ: οὔτ' ἐνυπάρχει E²FJ τὰ om. EL 23 γεγονὼς E 24 ἔσται] ἐστὶ EL 25 μεταβαλόντος EL 26 τε] τι J 27 καὶ τίνα τρόπον ἐνδέχεται om. E¹ 28 δέ om. E¹ 30 δὲ] δεῖ vel δὴ Φ¹ θεωρητέον FHL

καὶ τίσιν ὑπάρχει τῶν ὄντων καὶ πῶς, ἔτι δὲ πότερον ἔστι μίξις ἢ τοῦτο ψεῦδος. ἀδύνατον γάρ ἐστι μιχθῆναί τι ἕτερον ἑτέρῳ, καθάπερ λέγουσί τινες· ὄντων μὲν γὰρ ἔτι τῶν
327b μιχθέντων καὶ μὴ ἠλλοιωμένων οὐδὲν μᾶλλον μεμῖχθαί φασι νῦν ἢ πρότερον, ἀλλ' ὁμοίως ἔχειν· θατέρου δὲ φθαρέντος οὐ μεμῖχθαι, ἀλλὰ τὸ μὲν εἶναι τὸ δ' οὐκ εἶναι, τὴν δὲ μίξιν ὁμοίως ἐχόντων εἶναι· τὸν αὐτὸν δὲ τρόπον καὶ εἰ ἀμφοτέρων συνελθόντων ἔφθαρται τῶν μιγνυμένων ἑκάτερον, οὐ γὰρ εἶναι μεμιγμένα τά γε ὅλως οὐκ ὄντα. οὗτος μὲν οὖν ὁ λόγος ἔοικε ζητεῖν διορίσαι τί διαφέρει μίξις γενέσεως καὶ φθορᾶς, καὶ τί τὸ μικτὸν τοῦ γεννητοῦ καὶ φθαρτοῦ· δῆλον γὰρ ὡς δεῖ διαφέρειν, εἴπερ ἔστιν· ὥστε τούτων ὄντων φανερῶν τὰ διαπορηθέντα λύοιντ' ἄν. ἀλλὰ μὴν οὐδὲ τὴν ὕλην τῷ πυρὶ μεμῖχθαί φαμεν οὐδὲ μίγνυσθαι καιομένην, οὔτ' αὐτὴν αὐτῆς τοῖς μορίοις οὔτε τῷ πυρί, ἀλλὰ τὸ μὲν πῦρ γίνεσθαι τὴν δὲ φθείρεσθαι· τὸν αὐτὸν δὲ τρόπον οὐδὲ τῷ σώματι τὴν τροφὴν οὐδὲ τὸ σχῆμα τῷ κηρῷ μιγνύμενον σχηματίζειν τὸν ὄγκον· οὐδὲ τὸ σῶμα καὶ τὸ λευκὸν οὐδ' ὅλως τὰ πάθη καὶ τὰς ἕξεις οἷόν τε μεμῖχθαι τοῖς πράγμασιν—σωζόμενα γὰρ ὁρᾶται. ἀλλὰ μὴν οὐδὲ τὸ λευκόν γε καὶ τὴν ἐπιστήμην ἐνδέχεται μιχθῆναι, οὐδ' ἄλλο τῶν μὴ χωριστῶν οὐδέν. ἀλλὰ τοῦτο λέγουσιν οὐ καλῶς οἱ πάντα ποτὲ ὁμοῦ φάσκοντες εἶναι καὶ μεμῖχθαι· οὐ γὰρ ἅπαν ἅπαντι μικτόν, ἀλλ' ὑπάρχειν δεῖ χωριστὸν ἑκάτερον τῶν μιχθέντων, τῶν δὲ παθῶν οὐθὲν χωριστόν. ἐπεὶ δ' ἐστὶ τὰ μὲν δυνάμει τὰ δ' ἐνεργείᾳ τῶν ὄντων, ἐνδέχεται τὰ μιχθέντα εἶναί πως καὶ μὴ εἶναι, ἐνεργείᾳ μὲν ἑτέρου ὄντος τοῦ γεγονότος ἐξ αὐτῶν, δυνάμει δ' ἔτι ἑκατέρου ἅπερ ἦσαν πρὶν μιχθῆναι, καὶ οὐκ ἀπολωλότα—τοῦτο γὰρ ὁ λόγος διηπόρει πρότερον, φαίνεται δὲ τὰ μιγνύμενα

a 34 μιχθῆναί τι post 35 ἑτέρῳ ponit F b 1 καὶ τῶν μὴ H 1–2 νῦν μεμῖχθαί φασιν EL 4 ἐχόντων ὁμοίως J καὶ] κἂν EL 6 γὰρ om. L 7 διορίσαι om. FL τί] τίνι ELΦ¹ 8 τε καὶ φθορᾶς L γεννητοῦ FJ 10 λύοιτ' ἄν FJΦ¹ οὔτε EJΦ 11 τῷ πυρὶ τὴν ὕλην L μεμῖχθαι τῷ πυρί J 12 αὐτῆς] αὐτῆς H : αὐτοῖς FΓ 14 οὐδὲ prius] οὔτε FHJ 16 μεμῖχθαι] μίγνυσθαι EL 19 ἀλλὰ . . . 22 χωριστόν post 31 αὐτῶν ponit Φ^{c} 20 ὁμοῦ καὶ φάσκοντες EL 21 ἅπαν om. E ἅπαντι om. F 24 μὲν] μὲν μὴ εἶναι H 25 ὄντος ἑτέρου F δέ τι εἶναι ἑκάτερον H : δέ τι ἑκατέρου L 26 πρὶν μιχθῆναι in marg. add. F

πρότερόν τε ἐκ κεχωρισμένων συνιόντα καὶ δυνάμενα χωρίζεσθαι πάλιν. οὔτε διαμένουσιν οὖν ἐνεργείᾳ ὥσπερ τὸ σῶμα καὶ τὸ λευκόν, οὔτε φθείρονται, οὔτε θάτερον οὔτ' ἄμφω, σώζεται γὰρ ἡ δύναμις αὐτῶν. διὸ ταῦτα μὲν ἀφείσθω· τὸ δὲ συνεχὲς τούτοις ἀπόρημα διαιρετέον, πότερον ἡ μίξις πρὸς τὴν αἴσθησιν τί ἐστιν. ὅταν γὰρ οὕτως εἰς μικρὰ διαιρεθῇ τὰ μιγνύμενα καὶ τεθῇ παρ' ἄλληλα τοῦτον τὸν τρόπον ὥστε μὴ δῆλον ἕκαστον εἶναι τῇ αἰσθήσει, τότε μέμικται; ἢ οὔ, ἀλλ' ⟨ὅτε⟩ ἔστιν ὥστε ὁτιοῦν παρ' ὁτιοῦν εἶναι μόριον τῶν μιχθέντων; λέγεται μὲν οὖν ἐκείνως, οἷον κριθὰς μεμῖχθαι πυροῖς, ὅταν ἠτισοῦν παρ' ὁντινοῦν τεθῇ· εἰ δ' ἐστὶ πᾶν σῶμα διαιρετόν, εἴπερ ἐστὶ σῶμα σώματι μικτὸν ὁμοιομερές, ὁτιοῦν ἂν δέοι μέρος γίνεσθαι παρ' ὁτιοῦν. ἐπεὶ δ' οὐκ ἔστιν εἰς τὰ ἐλάχιστα διαιρεθῆναι, οὐδὲ σύνθεσις ταὐτὸ καὶ μίξις ἀλλ' ἕτερον, δῆλον ὡς οὔτε κατὰ μικρὰ σωζόμενα δεῖ τὰ μιγνύμενα φάναι μεμῖχθαι (σύνθεσις γὰρ ἔσται καὶ οὐ κρᾶσις οὐδὲ μίξις, οὐδ' ἕξει τὸν αὐτὸν λόγον τῷ ὅλῳ τὸ μόριον· φαμὲν δὲ δεῖν, εἴπερ μέμικται, τὸ μιχθὲν ὁμοιομερὲς εἶναι, καὶ ὥσπερ τοῦ ὕδατος τὸ μέρος ὕδωρ, οὕτω καὶ τοῦ κραθέντος· ἂν δ' ᾖ κατὰ μικρὰ σύνθεσις ἡ μίξις, οὐθὲν συμβήσεται τούτων, ἀλλὰ μόνον μεμιγμένα πρὸς τὴν αἴσθησιν, καὶ τὸ αὐτὸ τῷ μὲν μεμιγμένον, ἐὰν μὴ βλέπῃ ὀξύ, τῷ Λυγκεῖ δ' οὐθὲν μεμιγμένον) οὔτε τῇ διαιρέσει ὥστε ὁτιοῦν παρ' ὁτιοῦν μέρος, ἀδύνατον γὰρ οὕτω διαιρεθῆναι. ἢ οὖν οὐκ ἔστι μίξις, ἢ λεκτέον τοῦτο πῶς ἐνδέχεται γίγνεσθαι πάλιν. ἔστι δή, ὡς φαμεν, τῶν ὄντων τὰ μὲν ποιητικὰ τὰ δ' ὑπὸ τούτων παθητικά. τὰ μὲν οὖν ἀντιστρέφει,

b 28 πρότερόν τε in marg. add. F 30 φθείρεται EL θάτερον] ἑκάτερον EJL: καθ' ἑκάτερον H 32 συνεχὲς δὲ ELΦ¹ τούτοις] τούτου E 33 τί om. FHJ a 1 ὅτε e coni. addidi ὥστε] ὅτε H 3 ὅταν] ὅτε H ὁντιναοῦν H: ἠντιναοῦν L 4 εἴπερ ἐστὶ EFHJL: εἴπερ ἐστὶ καὶ Φ: καὶ εἴπερ ἐστὶ D^b: εἴπερ καὶ ἔστι Bekker, qui καὶ libro H perperam attribuit σώματι] τι, suprascr. σώμα, F 5 δέοι] δε, suprascr. η, F γενέσθαι F 6 τἀλάχιστα L οὐδὲ e coni. W. D. Ross scripsi: οὔτε EFHJLΦ 8 φᾶναι J μεμῖχθαι in litura fecit E οὐ] οὐδὲ H 10 δὲ δεῖν] δ' EL μέμικται] μεμῖχθαι E: δεῖ μεμῖχθαί τι L: μέμικταί τι (τι tamen in marg. addito) F 12 ᾖ om. E¹: ἡ F ἢ] ᾗ F 13 οὐδὲν ἂν συμβήσεται H 15 τι ὀξύ EFL γλυκεῖ E: λυγγεῖ H: lynceo Γ οὐθέν] non Γ 16 ὥστε] οὔτε coni. Bekker, sed nihil mutandum 17 ἔστι] ἔσται F 18 πάλιν γίγνεσθαι F δή] δέ F¹ ἔφαμεν F²L

ὅσων ἡ αὐτὴ ὕλη ἐστί, καὶ ποιητικὰ ἀλλήλων καὶ παθητικὰ ὑπ' ἀλλήλων· τὰ δὲ ποιεῖ ἀπαθῆ ὄντα, ὅσων μὴ ἡ αὐτὴ ὕλη. τούτων μὲν οὖν οὐκ ἔστι μίξις· διὸ οὐδ' ἡ ἰατρικὴ ποιεῖ ὑγίειαν οὐδ' ἡ ὑγίεια μιγνυμένη τοῖς σώμασιν. τῶν δὲ ποιητικῶν καὶ παθητικῶν ὅσα εὐδιαίρετα, πολλὰ μὲν ὀλίγοις καὶ μεγάλα μικροῖς συντιθέμενα οὐ ποιεῖ μίξιν, ἀλλ' αὔξησιν τοῦ κρατοῦντος· μεταβάλλει γὰρ θάτερον εἰς τὸ κρατοῦν (διὸ σταλαγμὸς οἴνου μυρίοις χοεῦσιν ὕδατος οὐ μίγνυται, λύεται γὰρ τὸ εἶδος καὶ μεταβάλλει εἰς τὸ πᾶν ὕδωρ)· ὅταν δὲ ταῖς δυνάμεσιν ἰσάζῃ πως, τότε μεταβάλλει μὲν ἑκάτερον εἰς τὸ κρατοῦν ἐκ τῆς αὑτοῦ φύσεως, οὐ γίνεται δὲ θάτερον ἀλλὰ μεταξὺ καὶ κοινόν. φανερὸν οὖν ὅτι ἐστὶ ταῦτα μικτὰ ὅσα ἐναντίωσιν ἔχει τῶν ποιούντων (ταῦτα γάρ ἐστιν ὑπ' ἀλλήλων παθητικά)· καὶ μικρὰ δὲ μικροῖς παρατιθέμενα μίγνυται μᾶλλον, ῥᾷον γὰρ καὶ θᾶττον ἄλληλα μεθιστᾶσι, τὸ δὲ πολὺ καὶ ὑπὸ πολλοῦ χρονίως τοῦτο δρᾷ. διὸ τὰ εὐ-
328b ριστα τῶν διαιρετῶν καὶ παθητικῶν μικτά—διαιρεῖται γὰρ εἰς μικρὰ ταῦτα ῥᾳδίως, τοῦτο γὰρ ἦν τὸ εὐορίστῳ εἶναι—οἷον τὰ ὑγρὰ μικτὰ μάλιστα τῶν σωμάτων· εὐόριστον γὰρ μάλιστα τὸ ὑγρὸν τῶν διαιρετῶν, ἐὰν μὴ γλίσχρον ᾖ (ταῦτα γὰρ δὴ πλείω καὶ μείζω μόνον ποιεῖ τὸν ὄγκον). ὅταν δ' ᾖ θάτερον μόνον παθητικόν, ἢ σφόδρα τὸ δὲ πάμπαν ἠρέμα, ἢ οὐθὲν πλεῖον τὸ μιχθὲν ἐξ ἀμφοῖν ἢ μικρόν, ὅπερ συμβαίνει περὶ τὸν καττίτερον καὶ τὸν χαλκόν. ἔνια γὰρ ψελλίζεται πρὸς ἄλληλα τῶν ὄντων καὶ ἐπαμφοτερίζει—φαίνεται γάρ πως καὶ μικτὰ ἠρέμα καὶ ὡς θάτερον μὲν δεκτικὸν θάτερον δ' εἶδος—ὅπερ καὶ ἐπὶ τούτων συμβαίνει· ὁ γὰρ καττίτερος ὡς πάθος τι ὢν ἄνευ ὕλης τοῦ χαλκοῦ

a 22 οὖν om. E 23 μιγνύμενα JL 24 ὅσα ἐστὶν εὐδιαίρετα F καὶ μεγάλα] μεγάλα δὲ F^1 25 οὐ] οὔ γε vel οὔτε E^1 26 διὸ] οἷον L 27 χοῦσιν E 28 μεταβάλλεται EL πᾶν τὸ H 30 αὑτοῦ] αὐτοῦ EFJ 31 καὶ om. F ἐστὶ ταῦτα] ἐστὶ supra lin. add. F : ταῦτ' ἐστὶ EL 32 τῶν om. F ποιούντων] τοιούτων J 32–33 γὰρ δὴ ὑπ' ἀλλήλων ἐστὶ EL 34 μεθιστᾶσι] μεθίστησιν FL
b 2 ταῦτα om. EL τοῦ εὐορίστως E 5 καὶ add. supra lineam ante ταῦτα F μόνον om. HJ τὸν ὄγκον ποιεῖ F 6 ὅταν] ὅ τ' ἂν J ᾖ om. F lacunam inter μόνον et παθητικόν habet J ἢ] ἢ F 7 ἢ ἠρέμα EHL ἢ prius om. E οὐδὲν τὸ μιχθὲν ἐξ (sed adiecto πλείω supra τὸ, correcto τὸ, et spatio ante ἐξ relicto) F 8 περὶ] παρὰ H 9 ψελίζεται J 11 καὶ om. EL 12 ὢν] ὂν E ἄνευ τῆς ὕλης H

σχεδὸν ἀφανίζεται καὶ μιχθεὶς ἄπεισι χρωματίσας μόνον. ταὐτὸ δὲ τοῦτο συμβαίνει καὶ ἐφ' ἑτέρων. φανερὸν τοίνυν ἐκ τῶν εἰρημένων καὶ ὅτι ἔστι μίξις καὶ τί ἐστι καὶ διὰ τί, καὶ ποῖα μικτὰ τῶν ὄντων, ἐπείπερ ἐστὶν ἕνια τοιαῦτα οἷα παθητικά τε ὑπ' ἀλλήλων καὶ εὐόριστα καὶ εὐδιαίρετα. ταῦτα γὰρ οὔτ' ἐφθάρθαι ἀνάγκη μεμιγμένα οὔτ' ἔτι ταὐτὰ ἁπλῶς εἶναι, οὔτε σύνθεσιν εἶναι τὴν μίξιν αὐτῶν, οὔτε πρὸς τὴν αἴσθησιν· ἀλλ' ἔστι μικτὸν μὲν ὃ ἂν εὐόριστον ὂν παθητικὸν ᾖ καὶ ποιητικόν, καὶ τοιούτῳ μικτόν (πρὸς ὁμώνυμον γὰρ τὸ μικτόν), ἡ δὲ μίξις τῶν μικτῶν ἀλλοιωθέντων ἕνωσις.

B

Περὶ μὲν οὖν μίξεως καὶ ἁφῆς καὶ τοῦ ποιεῖν καὶ πάσχειν εἴρηται πῶς ὑπάρχει τοῖς μεταβάλλουσι κατὰ φύσιν, ἔτι δὲ περὶ γενέσεως καὶ φθορᾶς τῆς ἁπλῆς, πῶς καὶ τίνος ἐστὶ καὶ διὰ τίν' αἰτίαν· ὁμοίως δὲ καὶ περὶ ἀλλοιώσεως εἴρηται, τί τὸ ἀλλοιοῦσθαι καὶ τίν' ἔχει διαφορὰν αὐτῶν· λοιπὸν δὲ θεωρῆσαι περὶ τὰ καλούμενα στοιχεῖα τῶν σωμάτων. γένεσις μὲν γὰρ καὶ φθορὰ πάσαις ταῖς φύσει συνεστώσαις οὐσίαις οὐκ ἄνευ τῶν αἰσθητῶν σωμάτων. τούτων δὲ τὴν ὑποκειμένην ὕλην οἱ μέν φασιν εἶναι μίαν, οἷον ἀέρα τιθέντες ἢ πῦρ ἤ τι μεταξὺ τούτων, σῶμά τε ὂν καὶ χωριστόν· οἱ δὲ πλείω τὸν ἀριθμὸν ἑνός—οἱ μὲν πῦρ καὶ γῆν, οἱ δὲ ταὐτά τε καὶ ἀέρα τρίτον, οἱ δὲ καὶ ὕδωρ τούτων τέταρτον, ὥσπερ Ἐμπεδοκλῆς—ἐξ ὧν συγκρινομένων καὶ διακρινομένων ἢ ἀλλοιουμένων συμβαίνειν τὴν γένεσιν καὶ τὴν φθορὰν τοῖς πράγμασιν. ὅτι μὲν οὖν τὰ πρῶτα ἀρχὰς καὶ στοιχεῖα καλῶς ἔχει λέγειν, ἔστω συνομολογούμενον, ἐξ ὧν

b 13 καὶ om. E^1JL, et in marg. add. F ἄπεισι] ἅπας E^1L : ὁ πᾶς J καὶ χρωματίσας L 14 τοίνυν καὶ ἐκ F 16 οἷα τὰ παθητικά H 17 ταῦτα] τὰ E 18 ταὐτὰ] ταῦτα E : τὰ αὐτὰ FJ 20 ὃ ἂν] ὅταν L : ὅταν μὲν E 21 ante ποιητικόν lituram habet J 22 ἕνωσις. περὶ μὲν οὖν μίξεως καὶ ἁφῆς καὶ περὶ τοῦ ποιεῖν καὶ πάσχειν εἴρηται HJ, et (omisso μὲν) F^1 26 καὶ περὶ τοῦ F 28 ἔτι δὲ] ἔτι καὶ E, δὲ in marg. addito τῆς ἁπλῆς, πῶς καὶ τίνος J^1D^b : τῆς ἁπλῆς, τίνος καὶ πῶς EJ^2 : τῆς ἁπλῆς καὶ τίνος καὶ πῶς HL : τῆς τινὸς καὶ ἁπλῶς καὶ πῶς (καὶ ante πῶς supra lineam addito) FΓ : τῆς τε ἁπλῆς καὶ τῆς τινός, πῶς coni. Bonitz 30 αὐτῶν om. F 35 τιθέντες om. L τι μεταξύ τι (secundo tamen τι eraso) F a 3 καὶ] ἢ FHJ 4 ἢ] καὶ J, et fecit E

μεταβάλλοντων ἢ κατὰ σύγκρισιν καὶ διάκρισιν ἢ κατ' ἄλλην μεταβολὴν συμβαίνει γένεσιν εἶναι καὶ φθοράν. ἀλλ' οἱ μὲν ποιοῦντες μίαν ὕλην παρὰ τὰ εἰρημένα, ταύτην δὲ σωματικὴν καὶ χωριστήν, ἁμαρτάνουσιν. ἀδύνατον γὰρ ἄνευ ἐναντιώσεως εἶναι τὸ σῶμα τοῦτο αἰσθητῆς—ἢ γὰρ κοῦφον ἢ βαρὺ ἢ ψυχρὸν ἢ θερμὸν ἀνάγκη εἶναι τὸ ἄπειρον τοῦτο, ὃ λέγουσί τινες εἶναι τὴν ἀρχήν. ὡς δ' ἐν τῷ Τιμαίῳ γέγραπται, οὐδένα ἔχει διορισμόν. οὐ γὰρ εἴρηκε σαφῶς τὸ παντελῶς δεχές, εἰ χωρίζεται τῶν στοιχείων, οὐδὲ χρῆται οὐδέν, φήσας εἶναι ὑποκείμενόν τι τοῖς καλουμένοις στοιχείοις πρότερον, οἷον χρυσὸν τοῖς ἔργοις τοῖς χρυσοῖς (καίτοι καὶ τοῦτο οὐ καλῶς λέγεται τοῦτον τὸν τρόπον λεγόμενον, ἀλλ' ὧν μὲν ἀλλοίωσις, ἔστιν οὕτως, ὧν δὲ γένεσις καὶ φθορά, ἀδύνατον ἐκεῖνο προσαγορεύεσθαι ἐξ οὗ γέγονεν—καίτοι γέ φησι μακρῷ ἀληθέστατον εἶναι χρυσὸν λέγειν ἕκαστον εἶναι), ἀλλὰ τῶν στοιχείων ὄντων στερεῶν μέχρι ἐπιπέδων ποιεῖται τὴν ἀνάλυσιν, ἀδύνατον δὲ τὴν τιθήνην καὶ τὴν ὕλην τὴν πρώτην τὰ ἐπίπεδα εἶναι. ἡμεῖς δὲ φαμὲν μὲν εἶναί τινα ὕλην τῶν σωμάτων τῶν αἰσθητῶν, ἀλλὰ ταύτην οὐ χωριστὴν ἀλλ' ἀεὶ μετ' ἐναντιώσεως, ἐξ ἧς γίνεται τὰ καλούμενα στοιχεῖα· διώρισται δὲ περὶ αὐτῶν ἐν ἑτέροις ἀκριβέστερον. οὐ μὴν ἀλλ' ἐπειδὴ καὶ τὸν τρόπον τοῦτόν ἐστιν ἐκ τῆς ὕλης τὰ σώματα τὰ πρῶτα, διοριστέον καὶ περὶ τούτων, ἀρχὴν μὲν καὶ πρώτην οἰομένοις εἶναι τὴν ὕλην τὴν ἀχώριστον μὲν ὑποκειμένην δὲ τοῖς ἐναντίοις (οὔτε γὰρ τὸ θερμὸν ὕλη τῷ ψυχρῷ οὔτε τοῦτο τῷ θερμῷ, ἀλλὰ τὸ ὑποκείμενον ἀμφοῖν), ὥστε πρῶτον μὲν τὸ δυνάμει σῶμα αἰσθητὸν ἀρχή, δεύτερον δ' αἱ ἐναντιώσεις, λέγω δ' οἷον θερμότης καὶ ψυχρότης, τρίτον δ' ἤδη πῦρ καὶ ὕδωρ καὶ τὰ τοιαῦτα. ταῦτα μὲν γὰρ

a 7 μεταβαλόντων L καὶ] ἢ E ἄλλην τινὰ F 11 αἰσθητῆς] αἰσθητόν E : τὸ αἰσθητόν F : αἰσθητὸν ὄν L 14 διωρισμόν J 15 οὐδέν] οὐδενί EH 17 καὶ om. L 18 ἀλλ' ὧν] ἀλλήλων E^1 20 ἐκεῖνο προσαγορεύεσθαι] κεῖνο προς ἐκεῖνο ἀγορεύεσθαι E^1 ἐξ] ἀφ' F 24 μὲν om. FHJLΦ^1 25 τῶν σωμάτων om. Φ^1 27 ἑτέροις] ἄλλοις Φ^1 28 ἐπειδὴ] ἐπεὶ E 29 μὲν om. F^1J πρῶτον F^1HJ 30 οἰομένους EJ : οἰόμενος Φ^1 31 οὔτε] οὐ (addito τε supra lin.) J τὸ om. H 32 οὔτε] οὐδὲ E : οὔτε δὲ H 34 αἱ om. E : αἱ πρῶται Γ ἐναντίωσις E καὶ om. E τρίτως EJ 35 δ' ἤδη] δὲ ἅμα fecit E : δὲ ὡς ἤδη H

μεταβάλλει εἰς ἄλληλα, καὶ οὐχ ὡς Ἐμπεδοκλῆς καὶ 329ᵇ
ἕτεροι λέγουσιν (οὐ γὰρ ἂν ἦν ἀλλοίωσις), αἱ δ' ἐναντιώσεις οὐ μεταβάλλουσιν. ἀλλ' οὐδὲν ἧττον καὶ ὥς, σώματος ποίας καὶ πόσας λεκτέον ἀρχάς; οἱ μὲν γὰρ ἄλλοι ὑποθέμενοι χρῶνται, καὶ οὐδὲν λέγουσι διὰ τί αὗται ἢ τοσαῦται. 5

2 Ἐπεὶ οὖν ζητοῦμεν αἰσθητοῦ σώματος ἀρχάς, τοῦτο δ' ἐστὶν ἁπτοῦ, ἁπτὸν δ' οὗ ἡ αἴσθησις ἀφή, φανερὸν ὅτι οὐ πᾶσαι αἱ ἐναντιώσεις σώματος εἴδη καὶ ἀρχὰς ποιοῦσιν, ἀλλὰ μόνον αἱ κατὰ τὴν ἀφήν· κατ' ἐναντίωσίν τε γὰρ 10 διαφέρουσι, καὶ κατὰ ἁπτὴν ἐναντίωσιν. διὸ οὔτε λευκότης καὶ μελανία οὔτε γλυκύτης καὶ πικρότης, ὁμοίως δ' οὐδὲ τῶν ἄλλων τῶν αἰσθητῶν ἐναντιώσεων οὐδὲν ποιεῖ στοιχεῖον. καίτοι πρότερον ὄψις ἁφῆς, ὥστε καὶ τὸ ὑποκείμενον πρότερον· ἀλλ' οὐκ ἔστι σώματος ἁπτοῦ πάθος ἢ ἁπτόν, ἀλλὰ 15 καθ' ἕτερον καὶ εἰ ἔτυχε τῇ φύσει πρότερον. αὐτῶν δὴ τῶν ἁπτῶν διαιρετέον ποῖαι πρῶται διαφοραὶ καὶ ἐναντιώσεις. εἰσὶ δ' ἐναντιώσεις κατὰ τὴν ἁφὴν αἵδε, θερμὸν ψυχρόν, ξηρὸν ὑγρόν, βαρὺ κοῦφον, σκληρὸν μαλακόν, γλίσχρον καῦρον, τραχὺ λεῖον, παχὺ λεπτόν. τούτων δὲ 20 βαρὺ μὲν καὶ κοῦφον οὐ ποιητικὰ οὐδὲ παθητικά· οὐ γὰρ τῷ ποιεῖν τι ἕτερον ἢ πάσχειν ὑφ' ἑτέρου λέγονται, δεῖ δὲ ποιητικὰ καὶ παθητικὰ εἶναι ἀλλήλων τὰ στοιχεῖα, μίγνυται γὰρ καὶ μεταβάλλει εἰς ἄλληλα. θερμὸν δὲ καὶ ψυχρὸν καὶ ξηρὸν καὶ ὑγρὸν τὰ μὲν τῷ ποιητικὰ εἶναι τὰ δὲ τῷ 25 παθητικὰ λέγεται· θερμὸν γάρ ἐστι τὸ συγκρῖνον τὰ ὁμογενῆ (τὸ γὰρ διακρίνειν, ὅπερ φασὶ ποιεῖν τὸ πῦρ, συγκρίνειν ἐστὶ τὰ ὁμόφυλα—συμβαίνει γὰρ ἐξαιρεῖν τὰ ἀλλότρια), ψυχρὸν δὲ τὸ συνάγον καὶ συγκρῖνον ὁμοίως τά

b 1 ὡς] ὥσπερ Φ¹ 2 οὐ] ἀεὶ F : οὐδὲ HL αἱ δ'] ἔτι αἱ fecit E 3 καὶ ὡς FHJL : καὶ fecit E 5 οὐδὲν] οὐδὲ F τί] τί ἢ JL 8 ἡ om. F 9 σώματος εἴδη] σώματος delendum notat et εἴδη ex ἤδη (ut videtur) fecit J 10 μόναι FHJ 11 κατὰ τὴν ἁπτὴν F 12 γλυκότης J 13 τῶν post ἄλλων om. FHJ 16 δὴ] δὲ FL 17 τῶν] πρῶτον E : πρῶτον τῶν F²L : πρῶτον καὶ τῶν F¹ ποῖαι δὴ πρῶται HJ 18 εἰσὶ δ' ἐναντιώσεις in marg. add. F 19 ὑγρὸν ξηρόν F 21 τῷ] τὸ J 22 ἕτερον] πρότερον E ἢ] οὐδὲ τῷ F λέγεται FL 23 καὶ . . . ἀλλήλων] ἀλλήλων καὶ παθητικὰ εἶναι F : εἶναι ἀλλήλων καὶ παθητικὰ L μίγνυται γὰρ] γίγνεται γὰρ καὶ μίγνυται FHJ 25 ὑγρὸν καὶ ξηρὸν EL τῷ prius om. E 29 ὁμοίως ante καὶ ponit L

τε συγγενῆ καὶ τὰ μὴ ὁμόφυλα, ὑγρὸν δὲ τὸ ἀόριστον οἰκείῳ ὅρῳ εὐόριστον ὄν, ξηρὸν δὲ τὸ εὐόριστον μὲν οἰκείῳ ὅρῳ, δυσόριστον δέ. τὸ δὲ λεπτὸν καὶ παχὺ καὶ γλίσχρον καὶ κραῦρον καὶ σκληρὸν καὶ μαλακὸν καὶ αἱ ἄλλαι διαφοραὶ ἐκ τούτων. ἐπεὶ γὰρ τὸ ἀναπληστικόν ἐστι τοῦ ὑγροῦ διὰ τὸ μὴ ὡρίσθαι μὲν εὐόριστον δ' εἶναι καὶ ἀκολουθεῖν τῷ
330[a] ἁπτομένῳ, τὸ δὲ λεπτὸν ἀναπληστικόν (λεπτομερὲς γάρ, καὶ τὸ μικρομερὲς ἀναπληστικόν· ὅλον γὰρ ὅλου ἅπτεται, τὸ δὲ λεπτὸν μάλιστα τοιοῦτον), φανερὸν ὅτι τὸ μὲν λεπτὸν ἔσται τοῦ ὑγροῦ τὸ δὲ παχὺ τοῦ ξηροῦ. πάλιν δὲ τὸ μὲν γλίσχρον τοῦ ὑγροῦ (τὸ γὰρ γλίσχρον ὑγρὸν πεπονθός τί ἐστιν, οἷον τὸ ἔλαιον) τὸ δὲ κραῦρον τοῦ ξηροῦ· κραῦρον γὰρ τὸ τελέως ξηρόν, ὥστε καὶ πεπηγέναι δι' ἔλλειψιν ὑγρότητος. ἔτι τὸ μὲν μαλακὸν τοῦ ὑγροῦ (μαλακὸν γὰρ τὸ ὑπεῖκον εἰς ἑαυτὸ καὶ μὴ μεθιστάμενον, ὅπερ ποιεῖ τὸ ὑγρόν—διὸ καὶ οὐκ ἔστι τὸ ὑγρὸν μαλακόν, ἀλλὰ τὸ μαλακὸν τοῦ ὑγροῦ) τὸ δὲ σκληρὸν τοῦ ξηροῦ· σκληρὸν γάρ ἐστι τὸ πεπηγός, τὸ δὲ πεπηγὸς ξηρόν. λέγεται δὲ ξηρὸν καὶ ὑγρὸν πλεοναχῶς· ἀντίκειται γὰρ τῷ ξηρῷ καὶ τὸ ὑγρὸν καὶ τὸ διερόν, καὶ πάλιν τῷ ὑγρῷ καὶ τὸ ξηρὸν καὶ τὸ πεπηγός, ἅπαντα δὲ ταῦτ' ἐστὶ τοῦ ξηροῦ καὶ τοῦ ὑγροῦ τῶν πρώτων λεχθέντων. ἐπεὶ γὰρ ἀντίκειται τῷ διερῷ τὸ ξηρόν, καὶ διερὸν μέν ἐστι τὸ ἔχον ἀλλοτρίαν ὑγρότητα ἐπιπολῆς, βεβρεγμένον δὲ τὸ εἰς βάθος, ξηρὸν δὲ τὸ ἐστερημένον ταύτης, φανερὸν ὅτι τὸ μὲν διερὸν ἔσται τοῦ ὑγροῦ, τὸ δ' ἀντικείμενον ξηρὸν τοῦ πρώτως ξηροῦ. πάλιν δὲ τὸ ὑγρὸν καὶ τὸ πεπηγὸς ὡσαύτως· ὑγρὸν μὲν γάρ ἐστι τὸ ἔχον οἰκείαν ὑγρότητα ἐν τῷ βάθει (βεβρεγμένον δὲ τὸ ἔχον ἀλλοτρίαν ὑγρότητα), πεπηγὸς δὲ

b 31 ὄν] δὲ ἀλλοτρίως H τὸ εὐόριστον] τὸ ἀόριστον E 32 παχὺ] παχύτερον E 33 καὶ σκληρὸν om. J : καὶ τὸ σκληρὸν L ἄλλαι] αἱ E **a** 1 λεπτομερὲς] μικρομερὲς L, et (ut videtur) Φ^c 4 ἔσται] ἐστι L 7 ξηρόν J^1, supra lineam tamen scripsit σκληρόν J^2 οἰκείας ὑγρότητος Γ 8 τοῦ ὑγροῦ μαλακὸν om. E post ὑγροῦ add. τὸ δὲ σκληρὸν τοῦ ξηροῦ F 9 μὴ om. EJ διὸ . . . 10 ὑγρὸν om. E 10 οὐκ ἔστι] οὐκέτι L 11 σκληρὸν γάρ] ξηρὸν γάρ E 14 δὲ] δὴ EF 17 ἀλλοτρίαν ἔχον J 19 πρώτως] πρώτου FHL 20 δὲ] δὴ F 21 γάρ om. F ἔχον τὴν οἰκείαν F ἐν τῷ βάθει om. F 22 βεβρεγμένον . . . ὑγρότητα om. HL : βεβρεγμένον δὲ τὸ ἔχον ἀλλοτρίαν ὑγρότητα ἐν τῷ βάθει in marg. (prima tamen manu) ponit J 22 post ὑγρότητα add. ἐν τῷ βάθει EF (cf. etiam J)

τὸ ἐστερημένον ταύτης, ὥστε καὶ τούτων ἐστὶ τὸ μὲν ξηροῦ τὸ δὲ ὑγροῦ. δῆλον τοίνυν ὅτι πᾶσαι αἱ ἄλλαι διαφοραὶ ἀνάγονται εἰς τὰς πρώτας τέτταρας, αὗται δὲ οὐκέτι εἰς ἐλάττους· οὔτε γὰρ τὸ θερμὸν ὅπερ ὑγρὸν ἢ ὅπερ ξηρόν, οὔτε τὸ ὑγρὸν ὅπερ θερμὸν ἢ ὅπερ ψυχρόν, οὔτε τὸ ψυχρὸν καὶ τὸ ξηρὸν οὔθ' ὑπ' ἄλληλ' οὔθ' ὑπὸ τὸ θερμὸν καὶ τὸ ὑγρόν εἰσιν· ὥστ' ἀνάγκη τέτταρας εἶναι ταύτας.

3 Ἐπεὶ δὲ τέτταρα τὰ στοιχεῖα, τῶν δὲ τεττάρων ἓξ αἱ συζεύξεις, τὰ δ' ἐναντία οὐ πέφυκε συνδυάζεσθαι (θερμὸν γὰρ καὶ ψυχρὸν εἶναι τὸ αὐτὸ καὶ πάλιν ὑγρὸν καὶ ξηρὸν ἀδύνατον), φανερὸν ὅτι τέτταρες ἔσονται αἱ τῶν στοιχείων συζεύξεις, θερμοῦ καὶ ξηροῦ, καὶ ὑγροῦ καὶ θερμοῦ, καὶ πάλιν ψυχροῦ καὶ ξηροῦ, καὶ ψυχροῦ καὶ ὑγροῦ. καὶ ἠκολούθηκε κατὰ λόγον τοῖς ἁπλοῖς φαινομένοις σώμασι, πυρὶ καὶ ἀέρι καὶ ὕδατι καὶ γῇ. τὸ μὲν γὰρ πῦρ θερμὸν καὶ ξηρόν, ὁ δ' ἀὴρ θερμὸν καὶ ὑγρόν (οἷον ἀτμὶς γὰρ ὁ ἀήρ), τὸ δ' ὕδωρ ψυχρὸν καὶ ὑγρόν, ἡ δὲ γῆ ψυχρὸν καὶ ξηρόν, ὥστ' εὐλόγως διανέμεσθαι τὰς διαφορὰς τοῖς πρώτοις σώμασι, καὶ τὸ πλῆθος αὐτῶν εἶναι κατὰ λόγον. ἅπαντες γὰρ οἱ τὰ ἁπλᾶ σώματα στοιχεῖα ποιοῦντες οἱ μὲν ἕν, οἱ δὲ δύο, οἱ δὲ τρία, οἱ δὲ τέτταρα ποιοῦσιν. ὅσοι μὲν οὖν ἓν μόνον λέγουσιν, εἶτα πυκνώσει καὶ μανώσει τἆλλα γενῶσι, τούτοις συμβαίνει δύο ποιεῖν τὰς ἀρχάς, τό τε μανὸν καὶ τὸ πυκνὸν ἢ τὸ θερμὸν καὶ τὸ ψυχρόν—ταῦτα γὰρ τὰ δημιουργοῦντα, τὸ δ' ἐν ὑπόκειται καθάπερ ὕλη. οἱ δ' εὐθὺς δύο ποιοῦντες, ὥσπερ Παρμενίδης πῦρ καὶ γῆν, τὰ μεταξὺ μίγματα ποιοῦσι τούτων, οἷον ἀέρα καὶ ὕδωρ, ὡσαύτως δὲ καὶ οἱ τρία λέγοντες (καθάπερ Πλάτων ἐν ταῖς διαιρέσεσιν,

a 23 ἐστὶ] ἔσται FHL ξηροῦ] ὑγροῦ J 24 ὑγροῦ] ξηροῦ J 26 τὸ supra lin. add. F ὑγρὸν] ψυχρὸν (suprascr. ξηρὸν) F ξηρόν] ὑγρόν F 28 οὐδ' . . . οὐδ' E τὸ post καὶ om. F 29 εἶναι ταύτας] αὐτὰς εἶναι H 30 ἐπειδὴ δὲ FHL τὰ om. L 32 ὑγρὸν καὶ ξηρὸν] ξηρὸν καὶ ὑγρὸν EL 34 καὶ ξηροῦ . . . θερμοῦ om. F, qui tamen καὶ ξηροῦ θερμοῦ καὶ ὑγροῦ in marg. add. καὶ ὑγροῦ καὶ θερμοῦ] καὶ θερμοῦ καὶ ὑγροῦ E : ψυχρου καὶ ὑγρου L b 1 πάλιν om. L, supra lin. add. F ψυχροῦ prius] θερμου L ξηροῦ E^2HJ : ὑγροῦ E^1FL καὶ ψυχροῦ E^2HJL : καὶ ξηροῦ E^1F καὶ ὑγροῦ E^2HJ : καὶ ψυχροῦ E^1, et supra lin. add. F : καὶ ξηρου L ἠκολούθησε HL 4 θερμὸς καὶ ὑγρός L 5 καὶ . . . ψυχρὸν om. E 6 νέμεσθαι E : διαφέρεσθαι F^1 8 γὰρ] δ' L 10 λέγουσι μόνον F 12 τὸ (ter) om. L τὰ om. EF^1HJ 15 ante μίγματα scripsit με E^1 16 τρεῖς L

τὸ γὰρ μέσον μῖγμα ποιεῖ)· καὶ σχεδὸν ταὐτὰ λέγουσιν οἵ τε δύο καὶ οἱ τρία ποιοῦντες, πλὴν οἱ μὲν τέμνουσιν εἰς δύο τὸ μέσον, οἱ δ' ἓν μόνον ποιοῦσιν. ἔνιοι δ' εὐθὺς τέτταρα λέγουσιν, οἷον Ἐμπεδοκλῆς· συνάγει δὲ καὶ οὗτος εἰς τὰ δύο, τῷ γὰρ πυρὶ τἆλλα πάντα ἀντιτίθησιν. οὐκ ἔστι δὲ τὸ πῦρ καὶ ὁ ἀὴρ καὶ ἕκαστον τῶν εἰρημένων ἁπλοῦν, ἀλλὰ μικτά. τὰ δ' ἁπλᾶ τοιαῦτα μέν ἐστιν, οὐ μέντοι ταὐτά, οἷον τὸ τῷ πυρὶ ὅμοιον πυροειδές, οὐ πῦρ, καὶ τὸ τῷ ἀέρι ἀεροειδές· ὁμοίως δὲ κἀπὶ τῶν ἄλλων. τὸ δὲ πῦρ ἐστιν ὑπερβολὴ θερμότητος, ὥσπερ καὶ κρύσταλλος ψυχρότητος· ἡ γὰρ πῆξις καὶ ἡ ζέσις ὑπερβολαί τινές εἰσιν, ἡ μὲν ψυχρότητος, ἡ δὲ θερμότητος· εἰ οὖν ὁ κρύσταλλός ἐστι πῆξις ὑγροῦ καὶ ψυχροῦ, καὶ τὸ πῦρ ἔσται ζέσις ξηροῦ καὶ θερμοῦ (διὸ καὶ οὐδὲν οὔτ' ἐκ κρυστάλλου γίγνεται οὔτ' ἐκ πυρός). ὄντων δὲ τεττάρων τῶν ἁπλῶν σωμάτων, ἑκάτερα τοῖν δυοῖν ἑκατέρου τῶν τόπων ἐστίν (πῦρ μὲν γὰρ καὶ ἀὴρ τοῦ πρὸς τὸν ὅρον φερομένου, γῆ δὲ καὶ ὕδωρ τοῦ πρὸς τὸ μέσον), καὶ ἄκρα μὲν καὶ εἰλικρινέστατα πῦρ καὶ γῆ, μέσα δὲ καὶ μεμιγμένα μᾶλλον· 331[a] ὕδωρ καὶ ἀήρ· καὶ ἑκάτερα δὲ ἑκατέροις ἐναντία—πυρὶ μὲν γὰρ ἐναντίον ὕδωρ, ἀέρι δὲ γῆ, ταῦτα γὰρ ἐκ τῶν ἐναντίων παθημάτων συνέστηκεν. οὐ μὴν ἀλλ' ἁπλῶς γε τέτταρα ὄντα ἑνὸς ἕκαστόν ἐστι, γῆ μὲν ξηροῦ μᾶλλον ἢ ψυχροῦ, ὕδωρ δὲ ψυχροῦ μᾶλλον ἢ ὑγροῦ, ἀὴρ δ' ὑγροῦ μᾶλλον ἢ θερμοῦ, πῦρ δὲ θερμοῦ μᾶλλον ἢ ξηροῦ.

Ἐπεὶ δὲ διώρισται πρότερον ὅτι τοῖς ἁπλοῖς σώμασιν 4 ἐξ ἀλλήλων ἡ γένεσις, ἅμα δὲ καὶ κατὰ τὴν αἴσθησιν φαίνεται γινόμενα (οὐ γὰρ ἂν ἦν ἀλλοίωσις· κατὰ γὰρ τὰ τῶν ἁπτῶν πάθη ἡ ἀλλοίωσίς ἐστιν), λεκτέον τίς ὁ τρόπος τῆς εἰς ἄλληλα μεταβολῆς, καὶ πότερον ἅπαν ἐξ ἅπαντος

b 18 οἱ prius om. EF ' 19 δὲ καὶ εὐθὺς FHL 20 οἷον] ὥσπερ L : ὡς (ut videtur) E[1] δὲ] γὰρ fecit E 21 πάντα τἆλλα HJL οὐκ ἔστι] οὐκέτι F 22 ὁ om. E μικτά] μικτόν L 23 ταὐτά] τοιαῦτα E τὸ] εἴ τι E : quod quidem igitur (= τὸ γοῦν?) Γ 24 οὐ . . . ἀεροειδές in marg. add. F 26 καὶ om. JΦ[1] 28 ὑγροῦ ψυχροῦ E 29 ξηροῦ θερμοῦ E : θερμοῦ καὶ ξηροῦ FHL 30 ἐκ utrumque om. E 31 ἑκάτερα EJ[2]Φ : ἑκάτερον FHJ[1]L δυεῖν L τόπων] πρώτων EJΓ 32 γὰρ om. E[1]JΓ 33 εἰλικρινῆ F 34 γῆ καὶ πῦρ JΦ[1] a 1 δὲ om. EL 3 γε om. F, post 4 ἑνὸς ponit Φ[1] 4 μὲν γὰρ ξηροῦ FHJ ψυχροῦ fecit E 5 ψυχρὸν J ἢ prius om. E 9 τὰ om. E[1] 10 ἡ om. EF

γίγνεσθαι δυνατὸν ἢ τὰ μὲν δυνατὸν τὰ δ' ἀδύνατον. ὅτι μὲν οὖν ἅπαντα πέφυκεν εἰς ἄλληλα μεταβάλλειν, φανερόν. ἡ γὰρ γένεσις εἰς ἐναντία καὶ ἐξ ἐναντίων, τὰ δὲ στοιχεῖα πάντα ἔχει ἐναντίωσιν πρὸς ἄλληλα διὰ τὸ τὰς διαφορὰς ἐναντίας εἶναι. τοῖς μὲν γὰρ ἀμφότεραι ἐναντίαι, οἷον πυρὶ καὶ ὕδατι (τὸ μὲν γὰρ ξηρὸν καὶ θερμόν, τὸ δ' ὑγρὸν καὶ ψυχρόν), τοῖς δ' ἡ ἑτέρα μόνον, οἷον ἀέρι καὶ ὕδατι (τὸ μὲν γὰρ ὑγρὸν καὶ θερμόν, τὸ δὲ ὑγρὸν καὶ ψυχρόν)· ὥστε καθόλου μὲν φανερὸν ὅτι πᾶν ἐκ παντὸς γίνεσθαι πέφυκεν, ἤδη δὲ καθ' ἕκαστον οὐ χαλεπὸν ἰδεῖν πῶς— ἅπαντα μὲν γὰρ ἐξ ἁπάντων ἔσται, διοίσει δὲ τῷ θᾶττον καὶ βραδύτερον καὶ τῷ ῥᾷον καὶ χαλεπώτερον. ὅσα μὲν γὰρ ἔχει σύμβολα πρὸς ἄλληλα, ταχεῖα τούτων ἡ μετάβασις, ὅσα δὲ μὴ ἔχει, βραδεῖα, διὰ τὸ ῥᾷον εἶναι τὸ ἓν ἢ τὰ πολλὰ μεταβάλλειν—οἷον ἐκ πυρὸς μὲν ἔσται ἀὴρ θατέρου μεταβάλλοντος (τὸ μὲν γὰρ ἦν θερμὸν καὶ ξηρόν, τὸ δὲ θερμὸν καὶ ὑγρόν, ὥστε ἂν κρατηθῇ τὸ ξηρὸν ὑπὸ τοῦ ὑγροῦ ἀὴρ ἔσται), πάλιν δὲ ἐξ ἀέρος ὕδωρ, ἐὰν κρατηθῇ τὸ θερμὸν ὑπὸ τοῦ ψυχροῦ (τὸ μὲν γὰρ ἦν θερμὸν καὶ ὑγρόν, τὸ δὲ ψυχρὸν καὶ ὑγρόν, ὥστε μεταβάλλοντος τοῦ θερμοῦ ὕδωρ ἔσται). τὸν αὐτὸν δὲ τρόπον καὶ ἐξ ὕδατος γῆ καὶ ἐκ γῆς πῦρ. ἔχει γὰρ ἄμφω πρὸς ἄμφω σύμβολα· τὸ μὲν γὰρ ὕδωρ ὑγρὸν καὶ ψυχρόν, ἡ δὲ γῆ ψυχρὸν καὶ ξηρόν, ὥστε κρατηθέντος τοῦ ὑγροῦ γῆ ἔσται, καὶ πάλιν ἐπεὶ τὸ μὲν πῦρ ξηρὸν καὶ θερμόν, ἡ δὲ γῆ ψυχρὸν καὶ ξηρόν, ἐὰν φθαρῇ τὸ ψυχρόν, πῦρ ἔσται ἐκ γῆς. ὥστε φανερὸν ὅτι κύκλῳ τε ἔσται ἡ γένεσις τοῖς ἁπλοῖς σώμασι, καὶ ῥᾷστος οὗτος ὁ τρόπος τῆς μεταβολῆς διὰ τὸ σύμβολα ἐνυπάρχειν τοῖς ἐφεξῆς. ἐκ πυρὸς δὲ ὕδωρ καὶ ἐξ ἀέρος γῆν καὶ πάλιν ἐξ ὕδατος καὶ γῆς ἀέρα καὶ πῦρ ἐνδέχεται μὲν γίνεσθαι, χαλεπώτερον δὲ διὰ τὸ πλειόνων εἶναι τὴν μεταβολήν. ἀνάγκη γάρ, εἰ ἔσται ἐξ ὕδατος πῦρ,

a 14 ἡ μὲν γὰρ FHJ 15 ἔχει πάντα J ἐναντίωσις E 16 ἀμφοτέροις L 17 θερμὸν καὶ ξηρόν EL 18 ἡ] ἢ F 19 ψυχρὸν καὶ ὑγρόν H 22 γὰρ om. F 23 τῷ] τὸ J 24 σύμβολον F 25 ἔχηι (sed ηι in litura) J 27 θατέρου] θᾶττον L 29 δὲ om. EL ὕδωρ ἔσται ἐὰν F ἂν J 30 ἦν ὑγρὸν καὶ θερμόν HJ 32 δὲ om. F 34 γὰρ om. F b 1 ἂν FHJ 2 τε om. L ἔσται om. EJ 4 σύμβολον F 5 ἐξ prius om. F

φθαρῆναι καὶ τὸ ψυχρὸν καὶ τὸ ὑγρόν, καὶ πάλιν εἰ ἐκ γῆς ἀήρ, φθαρῆναι καὶ τὸ ψυχρὸν καὶ τὸ ξηρόν· ὡσαύτως δὲ καὶ εἰ ἐκ πυρὸς καὶ ἀέρος ὕδωρ καὶ γῆ, ἀνάγκη γὰρ ἀμφότερα μεταβάλλειν. αὕτη μὲν οὖν χρονιωτέρα ἡ γένεσις· ἐὰν δ' ἑκατέρου θάτερον φθαρῇ, ῥᾷων μέν, οὐκ εἰς ἄλληλα δὲ ἡ μετάβασις, ἀλλ' ἐκ πυρὸς μὲν καὶ ὕδατος ἔσται γῆ καὶ ἀήρ, ἐξ ἀέρος δὲ καὶ γῆς πῦρ καὶ ὕδωρ. ὅταν μὲν γὰρ τοῦ ὕδατος φθαρῇ τὸ ψυχρὸν τοῦ δὲ πυρὸς τὸ ξηρόν, ἀὴρ ἔσται (λείπεται γὰρ τοῦ μὲν τὸ θερμὸν τοῦ δὲ τὸ ὑγρόν), ὅταν δὲ τοῦ μὲν πυρὸς τὸ θερμὸν τοῦ δ' ὕδατος τὸ ὑγρόν, γῆ διὰ τὸ λείπεσθαι τοῦ μὲν τὸ ξηρὸν τοῦ δὲ τὸ ψυχρόν. ὡσαύτως δὲ καὶ ἐξ ἀέρος καὶ γῆς πῦρ καὶ ὕδωρ· ὅταν μὲν γὰρ τοῦ ἀέρος φθαρῇ τὸ θερμὸν τῆς δὲ γῆς τὸ ξηρόν, ὕδωρ ἔσται (λείπεται γὰρ τοῦ μὲν τὸ ὑγρὸν τῆς δὲ τὸ ψυχρόν), ὅταν δὲ τοῦ μὲν ἀέρος τὸ ὑγρὸν τῆς δὲ γῆς τὸ ψυχρόν, πῦρ διὰ τὸ λείπεσθαι τοῦ μὲν τὸ θερμὸν τῆς δὲ τὸ ξηρόν, ἅπερ ἦν πυρός. ὁμολογουμένη δὲ καὶ τῇ αἰσθήσει ἡ τοῦ πυρὸς γένεσις· μάλιστα μὲν γὰρ πῦρ ἡ φλόξ, αὕτη δ' ἐστὶ καπνὸς καιόμενος, ὁ δὲ καπνὸς ἐξ ἀέρος καὶ γῆς. ἐν δὲ τοῖς ἐφεξῆς οὐκ ἐνδέχεται φθαρέντος ἐν ἑκατέρῳ θατέρου τῶν στοιχείων γενέσθαι μετάβασιν εἰς οὐδὲν τῶν σωμάτων διὰ τὸ λείπεσθαι ἐν ἀμφοῖν ἢ ταὐτὰ ἢ τἀναντία—ἐξ οὐδετέρων δὲ ἐγχωρεῖ γίγνεσθαι σῶμα—οἷον εἰ μὲν τοῦ πυρὸς φθαρείη τὸ ξηρόν, τοῦ δ' ἀέρος τὸ ὑγρόν (λείπεται γὰρ ἐν ἀμφοῖν τὸ θερμόν), ἐὰν δ' ἐξ ἑκατέρου τὸ θερμόν, λείπεται τἀναντία, ξηρὸν καὶ ὑγρόν. ὁμοίως δὲ καὶ ἐν τοῖς ἄλλοις· ἐν ἅπασι γὰρ τοῖς ἐφεξῆς ἐνυπάρχει τὸ μὲν ταὐτὸ τὸ δ' ἐναντίον, ὥσθ' ἅμα δῆλον ὅτι τὰ μὲν ἐξ ἑνὸς εἰς ἓν μεταβαίνοντα ἑνὸς φθαρέντος γίνεται, τὰ δ' ἐκ δυοῖν εἰς ἓν πλειόνων. ὅτι μὲν οὖν ἅπαντα ἐκ παντὸς γίγνεται, καὶ τίνα τρόπον εἰς ἄλληλα μετάβασις γίγνεται, εἴρηται· 332[a]

b 10 *πυρὸς . . . γῆ*] *γῆς καὶ ὕδατος πῦρ καὶ ἀήρ* H : eadem habet J, qui tamen (prima ut videtur manu) *πυρὸς καὶ ἀέρος ὕδωρ* suprascr. *ἀνάγκη* om. E : *ἀναγκαῖον* H *γὰρ*] *τὰ* E : om. L 12 *ἂν* F *φθαρῇ θάτερον* E *ῥᾷον* LΦ[1] 13 *μετάβασις*] *μεταβολή* (sed o correcto) E : *τούτων μετάβασις* HJΦ[1] 15 *τοῦ* prius] *τοῦτο* vel *τοῦ τε* E 17 *γῆ* om. E 18 *ψυχρὸν τοῦ δὲ τὸ ξηρόν* L 21 *ὑγρὸν*] *ψυχρὸν* E *τῆς*] *τοῦ* EJ *ψυχρόν*] *ὑγρόν* E *ὅταν δὲ* om. E 23 *ὑπολείπεσθαι* H *τῆς*] *τοῦ* EHJ 24 *ἡ* post *πυρὸς* ponit J[2] 25 *ἡ φλὸξ πῦρ* H 26 *καόμενος* J 28 *οὐδὲν*] *ἓν* F 29 *οὐδετέρου* F 30 *τοῦ μὲν* L 34 *ἐφεξῆς*] *ἑξῆς* FHJ *ταὐτὸν* FL 36 *δυεῖν* L

οὐ μὴν ἀλλ' ἔτι καὶ ὧδε θεωρήσωμεν περὶ αὐτῶν. εἰ γάρ ἐστι τῶν φυσικῶν σωμάτων ὕλη, ὥσπερ καὶ δοκεῖ ἐνίοις, ὕδωρ καὶ ἀὴρ καὶ τὰ τοιαῦτα, ἀνάγκη ἤτοι ἓν ἢ δύο εἶναι ταῦτα ἢ πλείω. ἓν μὲν δὴ πάντα οὐχ οἷόν τε, οἷον ἀέρα πάντα ἢ ὕδωρ ἢ πῦρ ἢ γῆν, εἴπερ ἡ μεταβολὴ εἰς τἀναντία. εἰ γὰρ εἴη ἀήρ, εἰ μὲν ὑπομένει, ἀλλοίωσις ἔσται ἀλλ' οὐ γένεσις (ἅμα δ' οὐδ' οὕτω δοκεῖ, ὥστε ὕδωρ εἶναι ἅμα καὶ ἀέρα ἢ ἄλλ' ὁτιοῦν)· ἔσται δή τις ἐναντίωσις καὶ διαφορὰ ἧς ἕξει τι θάτερον μόριον, τὸ πῦρ οἷον θερμότητα. ἀλλὰ μὴν οὐκ ἔσται τό γε πῦρ ἀὴρ θερμός· ἀλλοίωσίς τε γὰρ τὸ τοιοῦτον, καὶ οὐ φαίνεται. ἅμα δὲ πάλιν εἰ ἔσται ἐκ τοῦ πυρὸς ἀήρ, τοῦ θερμοῦ εἰς τοὐναντίον μεταβάλλοντος ἔσται· ὑπάρξει ἄρα τῷ ἀέρι τοῦτο, καὶ ἔσται ὁ ἀὴρ ψυχρόν τι, ὥστε ἀδύνατον τὸ πῦρ ἀέρα θερμὸν εἶναι, ἅμα γὰρ τὸ αὐτὸ θερμὸν καὶ ψυχρὸν ἔσται. ἄλλο τι ἄρ' ἀμφότερα τὸ αὐτὸ ἔσται, καὶ ἄλλη τις ὕλη κοινή. ὁ δ' αὐτὸς λόγος περὶ ἁπάντων, ὅτι οὐκ ἔστιν ἓν τούτων ἐξ οὗ τὰ πάντα. οὐ μὴν οὐδ' ἄλλο τί γε παρὰ ταῦτα, οἷον μέσον τι ἀέρος καὶ ὕδατος ἢ ἀέρος καὶ πυρός, ἀέρος μὲν παχύτερον καὶ πυρός, τῶν δὲ λεπτότερον· ἔσται γὰρ ἀὴρ καὶ πῦρ ἐκεῖνο μετ' ἐναντιότητος. ἀλλὰ στέρησις τὸ ἕτερον τῶν ἐναντίων, ὥστ' οὐκ ἐνδέχεται μονοῦσθαι ἐκεῖνο οὐδέποτε, ὥσπερ φασί τινες τὸ ἄπειρον καὶ τὸ περιέχον· ὁμοίως ἄρα ὁτιοῦν τούτων ἢ οὐδέν. εἰ οὖν μηδὲν αἰσθητόν γε πρότερον τούτων, ταῦτα ἂν εἴη πάντα· ἀνάγκη τοίνυν ἢ ἀεὶ μένοντα καὶ ἀμετάβλητα εἰς ἄλληλα ἢ μεταβάλλοντα, καὶ ἢ ἅπαντα, ἢ τὰ μὲν τὰ δ' οὔ, ὥσπερ ἐν τῷ Τιμαίῳ Πλά-

a 3 *θεωρήσομεν* E 4 *ἐστί τι τῶν* Φ1 *καὶ* om. F, et delendum notat J 5–6 *ἓν εἶναι ἢ δύο ταῦτα* F 6 *ἢ πλείω*] *πλείω ἢ* E1 7 *πάντα* in marg. add. F *εἴπερ* om. E 9 *οὐ*] *ην* E : *ἦν* J *ὥστε οὐδ' ὕδωρ* J 10 *ἀέρα*] *ἀὴρ* EFL 11 *διαφορὰ*] *φθορὰ* J *τι* om. J *τὸ πῦρ οἷον*] *οἷον τὸ πῦρ* fort. legendum 12 *γε* om. E, ante *τὸ* ponit L 13 *δὲ καὶ πάλιν* H 14 *τοῦ* prius om. EL 15 *τοῦτο* ante *ἄρα* ponit F, ante *τῷ* ponunt HJΦ1 16 *θερμὸν ἀέρα* EL 18 *ἄρ'*] *ἄρα παρ'* F1HJLΓ 19 *ὅτι* om. E 20 *τί* om. E *γε* om. LΦ1 *παρὰ ταῦτα*] *παρ' αὐτὰ* J 22 *καὶ*] *ἢ* EFH *δὲ ἄλλων* H1J *ἀὴρ γὰρ* E 23 *ἐκεῖνο* ante 22 *ἀὴρ* ponit F *ἐναντιότητος*] *ἐναντιώσεως* Φ 24 *ἐκεῖνο μονοῦσθαι* F 26 *ἢ* om. EL *οὐδέν*] *οὐδὲν ἀρχή* F (cf. Φc) : *οὐδὲν μᾶλλον ἀὴρ ἢ πῦρ* L *γε* om. L 27 *ἀνάγκη*] *ἀναγκαῖον* H *ἢ* om. E 29 *πάντα* FHJ *ἐν*] *καὶ ἐν* H

30 των ἔγραψεν. ὅτι μὲν τοίνυν μεταβάλλειν ἀνάγκη εἰς ἄλληλα δέδεικται πρότερον, καὶ ὅτι δ' οὐχ ὁμοίως ταχέως ἄλλο ἐξ ἄλλου [εἴρηται πρότερον], ὅτι τὰ μὲν ἔχοντα σύμβολον θᾶττον γίνεται ἐξ ἀλλήλων, τὰ δ' οὐκ ἔχοντα βραδύτερον. εἰ μὲν τοίνυν ἡ ἐναντιότης μία ἐστὶ καθ' ἣν μεταβάλλουσιν,
35 ἀνάγκη δύο εἶναι· ἡ γὰρ ὕλη τὸ μέσον ἀναίσθητος οὖσα
332b καὶ ἀχώριστος. ἐπεὶ δὲ πλείω ὁρᾶται ὄντα, δύο ἂν εἶεν αἱ ἐλάχισται. δύο δ' οὐσῶν οὐχ οἷόν τε τρία εἶναι, ἀλλὰ τέτταρα, ὥσπερ φαίνεται· τοσαῦται γὰρ αἱ συζυγίαι, ἐξ γὰρ οὐσῶν τὰς δύο ἀδύνατον γενέσθαι διὰ τὸ ἐναντίας εἶ-
5 ναι ἀλλήλαις. περὶ μὲν οὖν τούτων εἴρηται πρότερον· ὅτι δ', ἐπειδὴ μεταβάλλουσιν εἰς ἄλληλα, ἀδύνατον ἀρχήν τινα εἶναι αὐτῶν ἢ ἐπὶ τῷ ἄκρῳ ἢ μέσῳ, ἐκ τῶνδε δῆλον. ἐπὶ μὲν οὖν τοῖς ἄκροις οὐκ ἔσται, ὅτι πῦρ ἔσται ἢ γῆ πάντα, καὶ ὁ αὐτὸς λόγος τῷ φάναι ἐκ πυρὸς ἢ γῆς εἶναι πάντα·
10 ὅτι δ' οὐδὲ μέσον—ὥσπερ δοκεῖ τισιν ἀὴρ μὲν καὶ εἰς πῦρ μεταβάλλειν καὶ εἰς ὕδωρ, ὕδωρ δὲ καὶ εἰς ἀέρα καὶ εἰς γῆν, τὰ δ' ἔσχατα οὐκέτι εἰς ἄλληλα— * * * *. δεῖ μὲν γὰρ στῆναι καὶ μὴ εἰς ἄπειρον τοῦτο ἰέναι ἐπ' εὐθείας ἐφ' ἑκάτερα· ἄπειροι γὰρ ἐναντιότητες ἐπὶ τοῦ ἑνὸς ἔσονται. γῇ ἐφ' ᾧ
15 Γ, ὕδωρ ἐφ' ᾧ Υ, ἀὴρ ἐφ' ᾧ Α, πῦρ ἐφ' ᾧ Π. εἰ δὴ τὸ Α μεταβάλλει εἰς τὸ Π καὶ Υ, ἐναντιότης ἔσται τῶν Α Π. ἔστω ταῦτα λευκότης καὶ μελανία. πάλιν εἰ εἰς τὸ Υ τὸ Α, ἔσται ἄλλη· οὐ γὰρ ταὐτὸ τὸ Υ καὶ Π. ἔστω δὴ ξηρότης καὶ ὑγρότης, τὸ μὲν Ξ ξηρότης, τὸ δὲ Υ ὑγρότης.

a 30 et 35 *ἀνάγκη*] *ἀναγκαῖον* H 30 *ἀνάγκη* post *τοίνυν* ponit Φ^1, post *ἄλληλα* F 31 *δέδεικται*] *εἴρηται* Φ^1 *καὶ* om. FHJL 32 *εἴρηται πρότερον* seclusi 35 *ἀναίσθητος οὖσα*] *ἀναισθητουσα* J b 1 *αἱ* om. F^1 2 *οὐσῶν* HΓ (cf. Φ^c, Vitelli 244. 3) : *ὄντων* EFJL *τρία*] *τρεῖς* FJ^2 3 *φαίνονται* EL 6 *ἄλληλα*] *ἄλλα* E 7 *τὸ ἄκρον ἢ μέσον* F 8 *πάντα*] *τὰ πάντα* Φ^1 9 *τῷ*] *τὸ* FHJ *φάναι* J *ἢ ἐκ γῆς εἶναι* HJ : *εἶναι καὶ γῆς* F : *ἢ ἐξ ἀέρος εἶναι* Φ^c 10 *ὥσπερ*] *οἷον* HJΦ^1 11 *μεταβάλλει καὶ ὕδωρ* J 12 post *ἄλληλα* excidisse *δῆλον* vel *ἐκ τῶνδε δῆλον* suspicor *γὰρ* om. F 13 *μὴ*] *οὐκ* HJ 14 *γὰρ αἱ* FHJ *ἐφ' ᾧ*] *ἐφ' ᾗ* corr. supra lin. J^2 15 *ᾧ Υ*] *οὗ υ* H *εἰ*] *ἐπεὶ* L 16 *τὸ* om. EL *καὶ ἐναντιότης* L 17 post *μελανία*

ψ π a υ Γ
| | | | | , et in marg. (prima tamen m.)

ψ π a υ Γ
| | |Λ | |
λευ ΜΕ υΓ, add. J
Φ Κ ΞΗ^{P}
| |

εἰ] *ἐπεὶ* FHJ 18 *καὶ*] *τῷ* fecit E *δὴ*] *δὲ* EHJL

οὐκοῦν εἰ μὲν μένει τὸ λευκόν, ὑπάρξει τὸ ὕδωρ ὑγρὸν καὶ λευκόν, εἰ δὲ μή, μέλαν ἔσται τὸ ὕδωρ· εἰς τἀναντία γὰρ ἡ μεταβολή· ἀνάγκη ἄρα ἢ λευκὸν ἢ μέλαν εἶναι τὸ ὕδωρ. ἔστω δὴ τὸ πρῶτον· ὁμοίως τοίνυν καὶ τῷ Π τὸ Ξ ὑπάρξει ἡ ξηρότης. ἔσται ἄρα καὶ τῷ Π τῷ πυρὶ μεταβολὴ εἰς τὸ ὕδωρ· ἐναντία γὰρ ὑπάρχει, τὸ μὲν γὰρ πῦρ τὸ πρῶτον μέλαν ἦν, ἔπειτα δὲ ξηρόν, τὸ δ' ὕδωρ ὑγρόν, ἔπειτα δὲ λευκόν. φανερὸν δὴ ὅτι πᾶσιν ἐξ ἀλλήλων ἔσται ἡ μεταβολή, καὶ ἐπί γε τούτων ὅτι καὶ ἐν τῷ Γ τῇ γῇ ὑπάρξει τὰ λοιπὰ καὶ δύο σύμβολα, τὸ μέλαν καὶ τὸ ὑγρόν· ταῦτα γὰρ οὐ συνδεδύασταί πω. ὅτι δ' εἰς ἄπειρον οὐχ οἷόν τ' ἰέναι, ὅπερ μελλήσαντες δείξειν ἐπὶ τοῦτο ἔμπροσθεν ἤλθομεν, δῆλον ἐκ τῶνδε. εἰ γὰρ πάλιν τὸ πῦρ, ἐφ' ᾧ Π, εἰς ἄλλο μεταβαλεῖ καὶ μὴ ἀνακάμψει, οἷον εἰς τὸ Ψ, ἐναντιότης τις τῷ πυρὶ καὶ τῷ Ψ ἄλλη ὑπάρξει τῶν εἰρημένων· οὐδενὶ γὰρ τὸ αὐτὸ ὑπόκειται τῶν Γ Υ Α Π τὸ Ψ. ἔστω δὴ τῷ μὲν Π τὸ Κ, τῷ δὲ Ψ τὸ Φ. τὸ δὴ Κ πᾶσιν ὑπάρξει τοῖς Γ Υ Α Π, μεταβάλλουσι γὰρ εἰς ἄλληλα—ἀλλὰ γὰρ τοῦτο μὲν ἔστω μήπω δεδειγμένον, ἀλλ' ἐκεῖνο δῆλον, ὅτι εἰ πάλιν τὸ Ψ εἰς ἄλλο, ἄλλη ἐναντιότης καὶ τῷ Ψ ὑπάρξει καὶ τῷ πυρὶ τῷ Π. ὁμοίως δ' ἀεὶ μετὰ τοῦ προστιθεμένου ἐναντιότης τις ὑπάρξει τοῖς ἔμπροσθεν, ὥστ' εἰ ἄπειρα, καὶ ἐναντιότητες ἄπειροι τῷ ἑνὶ ὑπάρξουσιν. εἰ δὲ τοῦτο, οὐκ ἔσται οὔτε ὁρίσασθαι οὐδὲν οὔτε γενέσθαι· δεήσει γάρ, εἰ ἔσται ἄλλο ἐξ ἄλλου, τοσαύτας διεξελθεῖν ἐναντιότητας, καὶ ἔτι πλείους, ὥστ' εἰς ἔνια μὲν οὐδέποτ' ἔσται μεταβολή, οἷον εἰ ἄπειρα τὰ μεταξύ (ἀνάγκη δ', εἴπερ ἄπειρα τὰ στοιχεῖα), ἔτι δ' οὐδ' ἐξ ἀέρος εἰς πῦρ, εἰ ἄπειροι αἱ ἐναντιότητες. γίνεται δὲ καὶ πάντα ἕν· ἀνάγκη γὰρ πάσας

b 22 ἄρα μέλαν ἢ λευκὸν EL 23 δὴ] δὲ L τὸ λευκὸν πρῶτον F : τὸ ā πρῶτον J et fort. E¹ 24 τῷ πυρὶ τῷ π F¹ 25 ὑπάρξει E μὲν om. EFL πῦρ τὸ πρῶτον] πῦρ πρῶτον vel π τὸ πρῶτον F : πῦρ τὸ μὲν πρῶτον HJL 26 δὲ om. L 27 δὲ om. L δὴ] δὲ L 28 ἐν om. EL 30 πω] πως E²HL ἄπειρα F 31 μελήσαντες EF τοῦτο] τοῦ L 33 μεταβάλλει EFL 34 τις om. F τῷ πυρὶ π E ἄλλη om. E a 1 δὴ K] δὲ δὴ K F : δὲ K L 2 μεταβάλλει F¹ γὰρ incertum E 3 γὰρ om. H μήπω] μηδέπω FHJ 4 ἄλλη ἔσται ἐναντιότης F 5 καὶ prius om. E 8 ὁρίσασθαι] ὁρῖσθαι, suprascr. α, E : ὡρίσθαι F 9 ἄλλο ἔσται E διελθεῖν F 12 δ' om. L οὐδ' om. E εἰς] εἰ J αἱ om. L 13 γὰρ πάσας] γὰρ H : παραπασας J¹ : γὰρ ἁπάσας FJ²

ὑπάρχειν τοῖς μὲν κάτω τοῦ Π τὰς τῶν ἄνωθεν, τούτοις δὲ τὰς τῶν κάτωθεν, ὥστε πάντα ἓν ἔσται.

Θαυμάσειε δ' ἄν τις τῶν λεγόντων πλείω ἑνὸς τὰ στοιχεῖα τῶν σωμάτων ὥστε μὴ μεταβάλλειν εἰς ἄλληλα, καθάπερ Ἐμπεδοκλῆς φησι, πῶς ἐνδέχεται λέγειν αὐτοῖς εἶναι συμβλητὰ τὰ στοιχεῖα—καίτοι λέγει οὕτω, "ταῦτα γὰρ ἴσά τε πάντα". εἰ μὲν οὖν κατὰ τὸ ποσόν, ἀνάγκη ταὐτό τι εἶναι ὑπάρχον ἅπασι τοῖς συμβλητοῖς ᾧ μετροῦνται, οἷον εἰ ἐξ ὕδατος κοτύλης εἶεν ἀέρος δέκα· τὸ αὐτό τι ἦν ἄρα ἄμφω, εἰ μετρεῖται τῷ αὐτῷ. εἰ δὲ μὴ οὕτω κατὰ τὸ ποσὸν συμβλητὰ ὡς ποσὸν ἐκ ποσοῦ, ἀλλ' ὅσον δύναται, οἷον εἰ κοτύλη ὕδατος ἴσον δύναται ψύχειν καὶ δέκα ἀέρος, καὶ οὕτως κατὰ τὸ ποσὸν οὐχ ᾗ ποσὸν συμβλητά, ἀλλ' ᾗ δύναταί τι. εἴη δ' ἂν καὶ μὴ τῷ τοῦ ποσοῦ μέτρῳ συμβάλλεσθαι τὰς δυνάμεις, ἀλλὰ κατ' ἀναλογίαν, οἷον ὡς τόδε θερμὸν τόδε λευκόν· τὸ δ' ὡς τόδε σημαίνει ἐν μὲν ποιῷ τὸ ὅμοιον, ἐν δὲ τῷ ποσῷ τὸ ἴσον. ἄτοπον δὴ φαίνεται, εἰ τὰ σώματα ἀμετάβλητα ὄντα μὴ ἀναλογίᾳ συμβλητά ἐστιν, ἀλλὰ μέτρῳ τῶν δυνάμεων καὶ τῷ εἶναι ἴσον θερμὸν ἢ ὁμοίως πυρὸς τοσονδὶ καὶ ἀέρος πολλαπλάσιον· τὸ γὰρ αὐτὸ πλεῖον τῷ ὁμογενὲς εἶναι τοιοῦτον ἕξει τὸν λόγον. ἀλλὰ μὴν οὐδ' αὔξησις ἂν εἴη κατ' Ἐμπεδοκλέα, ἀλλ' ἢ κατὰ πρόσθεσιν· πυρὶ γὰρ αὔξει τὸ πῦρ, "αὔξει δὲ χθὼν μὲν σφέτερον δέμας, αἰθέρα δ' αἰθήρ", ταῦτα δὲ προστίθεται· δοκεῖ δ' οὐχ οὕτως αὔξεσθαι τὰ αὐξανόμενα. πολὺ δὲ χαλεπώτερον ἀποδοῦναι περὶ γενέσεως τῆς κατὰ φύσιν. τὰ γὰρ γινόμενα φύσει πάντα γίγνεται ἢ ἀεὶ ὠδὶ ἢ ὡς ἐπὶ τὸ πολύ, τὰ δὲ παρὰ τὸ ἀεὶ καὶ ὡς ἐπὶ τὸ πολὺ ἀπὸ ταὐ-

a 14 *τούτοις*] *τοῖς* F^1 15 *ἓν* om. L 18 *φησι*] *λέγει* EL *ἐνδέχεται*] *ἔσται* F 19 *εἶναι* om. F 20 *τε* om. F^1HJL *πάντα εἶναι. εἰ* E : *εἶναι* add. etiam F in margine *τὸ* om. EF^1 21 *ἐν ἅπασι* F 22 *εἶεν κοτύλαι ἀέρος* F *τὸ*] *τοῦτο* E 23 supra *εἰ* prius *γρ. ᾗ* scripsit H *τὸ* om. EF *πρόσον* E^1 24 *ἐμβλητὰ* L *ὡς* om. E : *οὐ* J *δύνανται* E 26 *καὶ* om. EL *τὸ* om. F^1 27 *δύνανται* L 28 *τὰς*] *καὶ τὰς* F 29 *λευκὸν τόδε θερμόν* EL *ἐν μὲν ποιῷ* om. E, ante *σημαίνει* ponit L 30 *τῷ* om. F 32 *τῷ*] *τὸ* JLΦ^1 33 *ὁμοίως* EJΦ : *ὅμοιον* FHL 34 *πλεῖον*] *πλεῖον ὄν* coni. H. W. B. Joseph *ὁμοιογενὲς* J 35 *εἴη ἄλλη κατ'* E *ἀλλ'* om. E *ἢ*] *ἡ* J : *ἢ ἡ* L b 2 *δέμας*] *γένος* EFL 3 *αὐξόμενα* H 5 *ὠδὶ . . .* 6 *καὶ* om. F^1 *ὠδὶ* om. EFL *ἢ ὡς*] *ὡ* J, corr. tamen supra lin. *τὸ* om. E 6 *τὸ ὡς ἐπὶ πολὺ* E

τομάτου καὶ ἀπὸ τύχης. τί οὖν τὸ αἴτιον τοῦ ἐξ ἀνθρώπου ἄνθρωπον ἢ ἀεὶ ἢ ὡς ἐπὶ τὸ πολύ, καὶ ἐκ τοῦ πυροῦ πυρὸν ἀλλὰ μὴ ἐλαίαν; ἢ καί, ἐὰν ὠδὶ συντεθῇ, ὀστοῦν; οὐ γὰρ ὅπως ἔτυχε συνελθόντων οὐδὲν γίγνεται, καθ' ἃ ἐκεῖνός φησιν, ἀλλὰ λόγῳ τινί. τί οὖν τούτου αἴτιον; οὐ γὰρ δὴ πῦρ γε ἢ γῆ· ἀλλὰ μὴν οὐδ' ἡ φιλία καὶ τὸ νεῖκος, συγκρίσεως γὰρ μόνον, τὸ δὲ διακρίσεως αἴτιον. τοῦτο δ' ἐστὶν ἡ οὐσία ἡ ἑκάστου, ἀλλ' οὐ μόνον "μίξις τε διάλλαξίς τε μιγέντων", ὥσπερ ἐκεῖνός φησιν. τύχη "δ' ἐπὶ τοῖς ὀνομάζεται", ἀλλ' οὐ λόγος· ἔστι γὰρ μιχθῆναι ὡς ἔτυχεν. τῶν δὴ φύσει ὄντων αἴτιον τὸ οὕτως ἔχειν, καὶ ἡ ἑκάστου φύσις αὕτη, περὶ ἧς οὐδὲν λέγει· οὐδὲν ἄρα περὶ φύσεως λέγει. ἀλλὰ μὴν καὶ τὸ εὖ τοῦτο καὶ τὸ ἀγαθόν· ὁ δὲ τὴν μίξιν μόνον ἐπαινεῖ. καίτοι τά γε στοιχεῖα διακρίνει οὐ τὸ νεῖκος, ἀλλ' ἡ φιλία τὰ φύσει πρότερα τοῦ θεοῦ—θεοὶ δὲ καὶ ταῦτα. ἔτι δὲ περὶ κινήσεως ἁπλῶς λέγει. οὐ γὰρ ἱκανὸν εἰπεῖν διότι ἡ φιλία καὶ τὸ νεῖκος κινεῖ, εἰ μὴ τοῦτ' ἦν φιλίᾳ εἶναι τὸ κινήσει τοιᾳδί, νείκει δὲ τὸ τοιᾳδί· ἔδει οὖν ἢ ὁρίσασθαι ἢ ὑποθέσθαι ἢ ἀποδεῖξαι, ἢ ἀκριβῶς ἢ μαλακῶς ἢ ἄλλως γέ πως. ἔτι δ' ἐπεὶ φαίνεται καὶ βίᾳ καὶ παρὰ φύσιν κινούμενα τὰ σώματα καὶ κατὰ φύσιν (οἷον τὸ πῦρ ἄνω μὲν οὐ βίᾳ, κάτω δὲ βίᾳ), τῷ δὲ βίᾳ τὸ κατὰ φύσιν ἐναντίον, ἔστι δὲ τὸ βίᾳ· ἔστιν ἄρα καὶ τὸ κατὰ φύσιν κινεῖσθαι. ταύτην οὖν ἡ φιλία κινεῖ; ἢ οὔ; τοὐναντίον γὰρ τὴν γῆν κάτω, καὶ διακρίσει ἔοικεν, καὶ μᾶλλον τὸ νεῖκος

b 7 ἀπὸ om. F τὸ supra lin. add. J 8 ἢ secundum om. L 9 οὐ γὰρ] ἀλλ' οὐχ FHJΦᶜ 10 καθ' ἃ] καθὰ EHLΦᶜ : καθάπερ F 11 οὖν] οὖν τὸ L τούτου EJ²Φᶜ : τούτων FHJ¹LΓ 13 γὰρ . . . διακρίσεως om. E¹ δ'] δέ γ' J 15 τύχη] φύσις E δ'] γὰρ J²Γ τοῖς scripsi, cf. Empedokles fr. 8 (Diels, p. 175) : τὸ ἴσον JΓ : τούτοις FHL et fort. E¹ : τούτων fecit E² (suprascr. οις) 16 ἔτυχεν] τύχη L 17 δὴ] δὲ F 18 οὐδὲν ante ἄρα incertum E 19 καὶ prius om. E, spatio duarum litterarum relicto καὶ secundum om. E τὸ secundum habent FJ²Φ, om. EHJ¹L μόνην L 20 καίτοι . . . 22 ταῦτα fort. supra post 13 αἴτιον legenda 20 γε] τε EFL διακρινεῖ J 22 δὲ καὶ περὶ L 23 φιλίᾳ] φιλίαν EL 24 τὸ secundum om. EFJL ἔδει] δεῖ H : incertum E ἢ om. H 25 ἀποδεῖξαι] ἀποδοῦναι E 26 ἄλλως] ἀμῶς coni. Bekker πῶς γε F . φαίνονται ELΦ¹ 27 τὸ om. EL 28 οὐ om. E τὸ δὲ βίᾳ τῷ κατὰ FH 31 κάτω] ἄνω FL, Bonitz διακρίσει] βίᾳ κινεῖν coni. Bonitz. Nihil tamen mutandum : scilicet ἡ κατὰ φύσιν κίνησις (cf. v. 32) τὴν γῆν κάτω κινεῖ, καὶ διακρίσει ἔοικεν

αἴτιον τῆς κατὰ φύσιν κινήσεως ἢ ἡ φιλία, ὥστε καὶ ὅλως παρὰ φύσιν ἡ φιλία ἂν εἴη μᾶλλον. ἁπλῶς δέ, εἰ μὴ ἡ φιλία ἢ τὸ νεῖκος κινεῖ, αὐτῶν τῶν σωμάτων οὐδεμία κίνησίς ἐστιν οὐδὲ μονή· ἀλλ' ἄτοπον. ἔτι δὲ καὶ φαίνεται κινούμενα—διέκρινε μὲν γὰρ τὸ νεῖκος, ἠνέχθη δ' ἄνω ὁ αἰθὴρ οὐχ ὑπὸ τοῦ νείκους, ἀλλ' ὁτὲ μέν φησιν ὥσπερ ἀπὸ τύχης ("οὕτω γὰρ συνέκυρσε θέων τότε, πολλάκι δ' ἄλλως") ὁτὲ δέ φησι πεφυκέναι τὸ πῦρ ἄνω φέρεσθαι, ὁ δ' αἰθήρ, φησί, "μακρῇσι κατὰ χθόνα δύετο ῥίζαις". ἅμα δὲ καὶ τὸν κόσμον ὁμοίως ἔχειν φησὶν ἐπί τε τοῦ νείκους νῦν καὶ πρότερον ἐπὶ τῆς φιλίας· τί οὖν ἐστι τὸ κινοῦν πρῶτον καὶ αἴτιον τῆς κινήσεως; οὐ γὰρ δὴ ἡ φιλία καὶ τὸ νεῖκος· ἀλλά τινος κινήσεως ταῦτα αἴτια, εἴ ⟨γ'⟩ ἐστὶν ἐκεῖνο ἀρχή. ἄτοπον δὲ καὶ εἰ ἡ ψυχὴ ἐκ τῶν στοιχείων ἢ ἕν τι αὐτῶν· αἱ γὰρ ἀλλοιώσεις αἱ τῆς ψυχῆς πῶς ἔσονται, οἷον τὸ μουσικὸν εἶναι καὶ πάλιν ἄμουσον, ἢ μνήμη ἢ λήθη; δῆλον γὰρ ὅτι εἰ μὲν πῦρ ἡ ψυχή, τὰ πάθη ὑπάρξει αὐτῇ ὅσα πυρὶ ἢ πῦρ, εἰ δὲ μικτόν, τὰ σωματικά· τούτων δ' οὐδὲν σωματικόν. ἀλλὰ περὶ μὲν τούτων ἑτέρας ἔργον ἐστὶ θεωρίας, περὶ 7
δὲ τῶν στοιχείων ἐξ ὧν τὰ σώματα συνέστηκεν, ὅσοις μὲν δοκεῖ τι εἶναι κοινὸν ἢ μεταβάλλειν εἰς ἄλληλα, ἀνάγκη εἰ θάτερον τούτων, καὶ θάτερον συμβαίνειν· ὅσοι δὲ μὴ ποιοῦσιν ἐξ ἀλλήλων γένεσιν μηδ' ὡς ἐξ ἑκάστου, πλὴν ὡς ἐκ τοίχου πλίνθους, ἄτοπον πῶς ἐξ ἐκείνων ἔσονται σάρκες καὶ ὀστᾶ καὶ τῶν ἄλλων ὁτιοῦν. ἔχει δὲ τὸ λεγόμενον ἀπορίαν καὶ τοῖς ἐξ ἀλλήλων γεννῶσιν, τίνα τρόπον γίγνεται ἐξ αὐτῶν ἕτερόν τι παρ' αὐτά. λέγω δ' οἷον ἐκ πυρὸς ἔστιν ὕδωρ καὶ ἐκ τούτου γίγνεσθαι πῦρ (ἔστι γάρ τι κοινὸν τὸ ὑποκείμενον), ἀλλὰ δὴ καὶ σὰρξ ἐξ αὐτῶν γίνεται καὶ μυελός·

b 33 ἡ secundum om. EFL 34 ἢ] καὶ E κινεῖ] κινοῖ HJ : κινοίη L a 2 περ ἀπὸ τύχης supra lin. add. F 3 θεῶν νοῦς τότε E πολλάκις F 4 φησι] φήσει F 5 δύεται ῥίζης (ut videtur) E ῥίζες J 6 τε om. EL 9 εἴ γ' ἐστὶν scripsi : εἰ ἔστιν EHJ : ἔστιν (εἰ δὲ in marg. additis) F : εἰ δ' ἔστιν L : si utique est Γ 12 ἢ λ.] καὶ λ. HJ : ἢ καὶ λ. F 14 σωματικόν] σωματικῶ L 15 ἀλλὰ γὰρ περὶ J μὲν om. FH ἐστὶν ἔργον HJ περὶ secundum] ἐκ J : περὶ fecerunt EF 17 τι εἶναι] εἶναί τι FJ : εἶναί τι ἢ H : εἶναι τὸ Φ^1 19 ὡς secundum om. E 23 παρ' αὐτά] παρὰ ταῦτα FHJ ἔστιν ἐκ πυρὸς EL 24 τούτου] τοῦ J πῦρ om. E

ταῦτα δὴ γίνεται πῶς; ἐκείνοις τε γὰρ τοῖς λέγουσιν ὡς Ἐμπεδοκλῆς τίς ἔσται τρόπος; ἀνάγκη γὰρ σύνθεσιν εἶναι καθάπερ ἐκ πλίνθων καὶ λίθων τοῖχος· καὶ τὸ μῖγμα δὲ τοῦτο ἐκ σωζομένων μὲν ἔσται τῶν στοιχείων, κατὰ μικρὰ δὲ παρ' ἄλληλα συγκειμένων· οὕτω δὴ σὰρξ καὶ τῶν ἄλλων ἕκαστον. συμβαίνει δὴ μὴ ἐξ ὁτουοῦν μέρους σαρκὸς γίγνεσθαι πῦρ καὶ ὕδωρ, ὥσπερ ἐκ κηροῦ γένοιτ' ἂν ἐκ μὲν τουδὶ τοῦ μέρους σφαῖρα, πυραμὶς δ' ἐξ ἄλλου τινός, ἀλλ' ἐνεδέχετό γε ἐξ ἑκατέρου ἑκάτερον γενέσθαι. τοῦτο μὲν δὴ τοῦτον γίνεται τὸν τρόπον, ⟨τὸ⟩ ἐκ τῆς σαρκὸς ἐξ ὁτουοῦν ἄμφω· τοῖς δ' ἐκείνως λέγουσιν οὐκ ἐνδέχεται, ἀλλ' ὡς ἐκ τοίχου λίθος καὶ πλίνθος, ἑκάτερον ἐξ ἄλλου τόπου καὶ μέρους. ὁμοίως δὲ καὶ τοῖς ποιοῦσι μίαν αὐτῶν ὕλην ἔχει τινὰ ἀπορίαν, πῶς ἔσται τι ἐξ ἀμφοτέρων, οἷον ψυχροῦ καὶ θερμοῦ ἢ πυρὸς καὶ γῆς. εἰ γάρ ἐστιν ἡ σὰρξ ἐξ ἀμφοῖν καὶ μηδέτερον ἐκείνων, μηδ' αὖ σύνθεσις σωζομένων, τί λείπεται πλὴν τὴν ὕλην εἶναι τὸ ἐξ ἐκείνων; ἡ γὰρ θατέρου φθορὰ ἢ θάτερον ποιεῖ ἢ τὴν ὕλην. ἆρ' οὖν ἐπειδή ἐστι καὶ μᾶλλον καὶ ἧττον θερμὸν καὶ ψυχρόν, ὅταν μὲν ἁπλῶς ᾖ θάτερον ἐντελεχείᾳ, δυνάμει θάτερον ἔσται· ὅταν δὲ μὴ παντελῶς, ἀλλ' ὡς μὲν θερμὸν ψυχρόν, ὡς δὲ ψυχρὸν θερμὸν (διὰ τὸ μιγνύμενα φθείρειν τὰς ὑπεροχὰς ἀλλήλων), τότε οὔθ' ἡ ὕλη ἔσται οὔτε ἐκείνων τῶν ἐναντίων ἑκάτερον ἐντελεχείᾳ ἁπλῶς, ἀλλὰ μεταξύ, κατὰ δὲ τὸ δυνάμει μᾶλλον εἶναι θερμὸν ἢ ψυχρόν, ἢ τοὐναντίον, κατὰ τοῦτον τὸν λόγον διπλασίως θερμὸν δυνάμει ἢ ψυχρόν, ἢ τριπλασίως, ἢ κατ' ἄλλον τρόπον τοιοῦτον; ἔσται

a 26 δὴ] δὲ H : δὴ fecit F τοῖς γὰρ E ὡς] ὥσπερ F 28 πλίνθων καὶ ἐκ λίθων H : λίθων καὶ πλίνθων F δὲ] δὴ FHJL 29 τοῦτο] τὸ ἓν HJ μὲν om. H 31 ἕκαστον. συμβαίνει γοῦν οὕτω λέγουσι μὴ ἐκ παντὸς μέρους σαρκὸς γίνεσθαι ἀέρα ὕδωρ καὶ τὰ ἕτερα, ἀλλὰ ἐξ ἑκατέρου ἑκάτερον, τουτέστιν ἐκ πάντων παρατεθειμένων καὶ ἐνυπαρχόντων ἐνεργείᾳ ἅπαντα διακρίνεσθαι, ὅπερ οὐχ οὕτω φαίνεται. συμβαίνει L δὴ] δὲ H 32 ὥσπερ εἰ ἐκ in marg. add. F 34 γε] καὶ L γενέσθαι] γίγνεσθαι F 35 τὸ e coni. addidi : cf. Φc (Vitelli 274. 5) ἐξ ὁτουοῦν] ἐξωτοῦ οὖν J b 4 οἷον ἐκ θερμοῦ καὶ ψυχροῦ E ἢ] καὶ E 6 σύνθεσις] σύνθεσιν E : συνθέσει Ł τὴν EFHJLΦc : om. Bekker τὸ om. E 7 γὰρ ἐκ θατέρου HJ : γὰρ ἑκατέρου Db ἐποίει FHJ ἢ secundum om. E 8 καὶ ψ.] ἢ ψ. F 11 διαφθείρειν H 15 κατὰ] ἑκάτερον κατὰ F : καὶ κατὰ L τοῦτον τὸν] τὸν τούτων HJL διπλασίως] καὶ τῷ λόγῳ διπλασίως F1HJ : καὶ διπλασίως L 16 τοιοῦτον τρόπον F

δὴ μιχθέντων τἆλλ' ἐκ τῶν ἐναντίων ἢ τῶν στοιχείων, καὶ τὰ στοιχεῖα ἐξ ἐκείνων δυνάμει πως ὄντων, οὐχ οὕτω δὲ ὡς ἡ ὕλη, ἀλλὰ τὸν εἰρημένον τρόπον—καὶ ἔστιν οὕτω μὲν μίξις, ἐκείνως δὲ ὕλη τὸ γινόμενον. ἐπεὶ δὲ καὶ πάσχει τἀναντία κατὰ τὸν ἐν τοῖς πρώτοις διορισμόν· ἔστι γὰρ τὸ ἐνεργείᾳ θερμὸν δυνάμει ψυχρὸν καὶ τὸ ἐνεργείᾳ ψυχρὸν δυνάμει θερμόν, ὥστε ἐὰν μὴ ἰσάζῃ μεταβάλλει εἰς ἄλληλα, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ἐναντίων· καὶ πρῶτον οὕτω τὰ στοιχεῖα μεταβάλλει, ἐκ δὲ τούτων σάρκες καὶ ὀστᾶ καὶ τὰ τοιαῦτα, τοῦ μὲν θερμοῦ γιγνομένου ψυχροῦ, τοῦ δὲ ψυχροῦ θερμοῦ, ὅταν πρὸς τὸ μέσον ἔλθῃ (ἐνταῦθα γὰρ οὐδέτερον), τὸ δὲ μέσον πολὺ καὶ οὐκ ἀδιαίρετον. ὁμοίως δὲ καὶ τὸ ξηρὸν καὶ ὑγρὸν καὶ τὰ τοιαῦτα κατὰ μεσότητα ποιοῦσι σάρκα καὶ ὀστοῦν καὶ τἆλλα.

8 Ἅπαντα δὲ τὰ μικτὰ σώματα, ὅσα περὶ τὸν τοῦ μέσου τόπον ἐστίν, ἐξ ἁπάντων σύγκειται τῶν ἁπλῶν. γῆ μὲν γὰρ ἐνυπάρχει πᾶσι διὰ τὸ ἕκαστον εἶναι μάλιστα καὶ πλεῖστον ἐν τῷ οἰκείῳ τόπῳ· ὕδωρ δὲ διὰ τὸ δεῖν μὲν ὁρίζεσθαι τὸ σύνθετον, μόνον δ' εἶναι τῶν ἁπλῶν εὐόριστον τὸ 335[a] ὕδωρ, ἔτι δὲ καὶ τὴν γῆν ἄνευ τοῦ ὑγροῦ μὴ δύνασθαι συμμένειν, ἀλλὰ τοῦτ' εἶναι τὸ συνέχον—εἰ γὰρ ἐξαιρεθείη τελέως ἐξ αὐτῆς τὸ ὑγρόν, διαπίπτοι ἄν. γῇ μὲν οὖν καὶ ὕδωρ διὰ ταύτας ἐνυπάρχει τὰς αἰτίας, ἀὴρ δὲ καὶ πῦρ, ὅτι ἐναντία ἐστὶ γῇ καὶ ὕδατι (γῇ μὲν γὰρ ἀέρι, ὕδωρ δὲ πυρὶ ἐναντίον ἐστίν, ὡς ἐνδέχεται οὐσίαν οὐσίᾳ ἐναντίαν εἶναι)· ἐπεὶ οὖν αἱ γενέσεις ἐκ τῶν ἐναντίων εἰσίν, ἐνυπάρχει δὲ θάτερα ἄκρα τῶν ἐναντίων, ἀνάγκη καὶ θάτερα ἐνυπάρχειν, ὥστ' ἐν ἅπαντι τῷ συνθέτῳ πάντα τὰ ἁπλᾶ ἐνέσται. μαρτυρεῖν δ' ἔοικε καὶ ἡ τροφὴ ἑκάστου· ἅπαντα μὲν γὰρ τρέφεται τοῖς

b 17 δὴ] μὴ E, et suprascr. J[2] τἆλλ'] ἀλλ' E 19 οὕτω] τοῦτο HJ, Φ[1] (codd. RZ) Φ[c] μίξις] μείξεις E 20 δὲ ἡ ὕλη FL ἐπεὶ δὲ] ἐπεὶ δὴ E : ἐπειδὴ Φ[1] 23 ἐὰν] ἂν H εἰς om. EL 24 post πρῶτον add. γε Φ[1] et (supra lin.) J[2] 26 γενομένου F 27 ἔλθῃ] ἔλθωσιν HJ 29 τὸ om. HJL post τὰ add. ἄλλα τὰ in marg. F : cf. etiam Φ et Γ 30 ὀστοῦν] ὀστᾶ (quod libris FH perperam attribuit) Bekker τἆλλα τὰ τοιαῦτα F[1]HJ 31 ἅπαντα] πάντα JΦ[1] 32 γῆ] γῆς H 33 γὰρ om. F 34 δὲ] δὴ L 35 τὸν σύνθετον J ἁπλῶν] ἄλλων Φ a 4 ἐνυπάρχουσι F 5 γὰρ om. F 6 ἐναντίαν] ἐναντίον H 7 θάτερα] θάτερον L 8 ἄκρα om. H, supra lin. add. J : ἄκρον L θάτερα] θάτερον HL 10 ἑκάστου E[1]H : ἑκάστων E[2]FJL

αὐτοῖς ἐξ ὧνπέρ ἐστιν, ἅπαντα δὲ πλείοσι τρέφεται. καὶ γὰρ ἅπερ ἂν δόξειεν ἑνὶ μόνῳ τρέφεσθαι, τῷ ὕδατι τὰ φυτά, πλείοσι τρέφεται· μέμικται γὰρ τῷ ὕδατι γῆ· διὸ καὶ οἱ γεωργοὶ πειρῶνται μίξαντες ἄρδειν. ἐπεὶ δ' ἐστὶν ἡ μὲν τροφὴ τῆς ὕλης, τὸ δὲ τρεφόμενον συνειλημμένη τῇ ὕλῃ ἡ μορφὴ καὶ τὸ εἶδος, εὔλογον ἤδη τὸ μόνον τῶν ἁπλῶν σωμάτων τρέφεσθαι τὸ πῦρ ἁπάντων ἐξ ἀλλήλων γινομένων, ὥσπερ καὶ οἱ πρότεροι λέγουσιν· μόνον γάρ ἐστι καὶ μάλιστα τοῦ εἴδους τὸ πῦρ διὰ τὸ πεφυκέναι φέρεσθαι πρὸς τὸν ὅρον. ἕκαστον δὲ πέφυκεν εἰς τὴν ἑαυτοῦ φέρεσθαι χώραν· ἡ δὲ μορφὴ καὶ τὸ εἶδος ἁπάντων ἐν τοῖς ὅροις. ὅτι μὲν οὖν ἅπαντα τὰ σώματα ἐξ ἀπάντων συνέστηκε τῶν ἁπλῶν, εἴρηται.

9 Ἐπεὶ δ' ἐστὶν ἔνια γενητὰ καὶ φθαρτά, καὶ ἡ γένεσις τυγχάνει οὖσα ἐν τῷ περὶ τὸ μέσον τόπῳ, λεκτέον περὶ πάσης γενέσεως ὁμοίως πόσαι τε καὶ τίνες αὐτῆς ἀρχαί· ῥᾷον γὰρ οὕτω τὰ καθ' ἕκαστα θεωρήσομεν, ὅταν περὶ τῶν καθόλου λάβωμεν πρῶτον. εἰσὶν οὖν καὶ τὸν ἀριθμὸν ἴσαι καὶ τῷ γένει αἱ αὐταὶ αἵπερ ἐν τοῖς ἀϊδίοις τε καὶ πρώτοις· ἡ μὲν γάρ ἐστιν ὡς ὕλη, ἡ δ' ὡς μορφή. δεῖ δὲ καὶ τὴν τρίτην ἔτι προσυπάρχειν· οὐ γὰρ ἱκαναὶ πρὸς τὸ γεννῆσαι αἱ δύο, καθάπερ οὐδ' ἐν τοῖς πρώτοις. ὡς μὲν οὖν ὕλη τοῖς γενητοῖς ἐστιν αἴτιον τὸ δυνατὸν εἶναι καὶ μὴ εἶναι—τὰ μὲν γὰρ ἐξ ἀνάγκης ἔστιν, οἷον τὰ ἀΐδια, τὰ δ' ἐξ ἀνάγκης οὐκ ἔστιν (τούτων δὲ τὰ μὲν ἀδύνατον μὴ εἶναι, τὰ δὲ ἀδύνατον εἶναι, διὰ τὸ μὴ ἐνδέχεσθαι παρὰ τὸ ἀναγκαῖον ἄλλως ἔχειν), ἔνια δὲ καὶ εἶναι καὶ μὴ εἶναι δυνατά—ὅπερ ἐστὶ τὸ γενητὸν καὶ φθαρτόν· ποτὲ μὲν γὰρ ἔστι τοῦτο, ποτὲ δ' οὐκ ἔστιν· ὥστ' ἀνάγκη γένεσιν εἶναι καὶ φθορὰν περὶ τὸ δυνατὸν

a 11 ἐστιν] εἰσίν FH πλείοσι J 12 γάρ ἐστιν (superposito ὅσα) ἅπερ F μάλιστα post δόξειεν add. JL (delendum tamen notat J²), post τρέφεσθαι add. H 14 καὶ post γεωργοὶ ponit E, omisso οἱ supra ἄρδειν add. κόπρα E 15 τρεφόμενον δὲ F συνειλημμένη] ἡ συνειλημμένη J : συνειλημμένον FL et (ut videtur) H : τὸ συνειλημμένον Φ 16 ὕλῃ μορφῇ J 17 ἐξ] γὰρ ἐξ H, qui 18 γάρ om. 18 πρότεροι] πρότερον L : ποιηταὶ (ut videtur) Φᵉ 20 ἑαυτοῦ] αὐτοῦ HJ 20–21 χώραν φέρεσθαι EL 24 γεννητὰ L, et ubique 26 τε om. FΦᵉ αὐτῆς] αὐτῶν FΦᵉ ἀρχαί EFHJL : αἱ ἀρχαί Φᵉ et Bekker 27 ἕκαστα] ἕκαστον EL θεωρήσωμεν J 31 γὰρ ἂν ἱκαναὶ EL αἱ om. EL 32 οὖν om. F γεννητοῖς HL 33 αἴτιον post μὴ εἶναι ponit F δυνατὸν om. L 34 οὐκ ἔστιν ἐξ ἀνάγκης F b 4 ἀνάγκη] ἀναγκαῖον F

εἶναι καὶ μὴ εἶναι. διὸ καὶ ὡς μὲν ὕλη τοῦτ' ἐστὶν αἴτιον τοῖς γενητοῖς, ὡς δὲ τὸ οὗ ἕνεκα ἡ μορφὴ καὶ τὸ εἶδος· τοῦτο δ' ἐστὶν ὁ λόγος ὁ τῆς ἑκάστου οὐσίας. δεῖ δὲ προσεῖναι καὶ τὴν τρίτην, ἣν ἅπαντες μὲν ὀνειρώττουσι, λέγει δ' οὐδείς. ἀλλ' οἱ μὲν ἱκανὴν ᾠήθησαν αἰτίαν εἶναι πρὸς τὸ γίνεσθαι τὴν τῶν εἰδῶν φύσιν (ὥσπερ ὁ ἐν τῷ Φαίδωνι Σωκράτης—καὶ γὰρ ἐκεῖνος, ἐπιτιμήσας τοῖς ἄλλοις ὡς οὐδὲν εἰρηκόσιν, ὑποτίθεται ὅτι ἐστὶ τῶν ὄντων τὰ μὲν εἴδη τὰ δὲ μεθεκτικὰ τῶν εἰδῶν, καὶ ὅτι εἶναι μὲν ἕκαστον λέγεται κατὰ τὸ εἶδος, γίνεσθαι δὲ κατὰ τὴν μετάληψιν καὶ φθείρεσθαι κατὰ τὴν ἀποβολήν, ὥστ' εἰ ταῦτα ἀληθῆ, τὰ εἴδη οἴεται ἐξ ἀνάγκης αἴτια εἶναι καὶ γενέσεως καὶ φθορᾶς), οἱ δ' αὐτὴν τὴν ὕλην, ἀπὸ ταύτης γὰρ εἶναι τὴν κίνησιν. οὐδέτεροι δὲ λέγουσι καλῶς. εἰ μὲν γάρ ἐστιν αἴτια τὰ εἴδη, διὰ τί οὐκ ἀεὶ γεννᾷ συνεχῶς, ἀλλὰ ποτὲ μὲν ποτὲ δ' οὔ, ὄντων καὶ τῶν εἰδῶν ἀεὶ καὶ τῶν μεθεκτικῶν; ἔτι δ' ἐπ' ἐνίων θεωροῦμεν ἄλλο τὸ αἴτιον ὄν· ὑγίειαν γὰρ ὁ ἰατρὸς ἐμποιεῖ καὶ ἐπιστήμην ὁ ἐπιστήμων, οὔσης καὶ ὑγιείας αὐτῆς καὶ ἐπιστήμης καὶ τῶν μεθεκτικῶν, ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν κατὰ δύναμιν πραττομένων. εἰ δὲ τὴν ὕλην τις φήσειε γεννᾶν διὰ τὴν κίνησιν, φυσικώτερον μὲν ἂν λέγοι τῶν οὕτω λεγόντων (τὸ γὰρ ἀλλοιοῦν καὶ τὸ μετασχηματίζον αἰτιώτερόν τε τοῦ γεννᾶν, καὶ ἐν ἅπασιν εἰώθαμεν τοῦτο λέγειν τὸ ποιοῦν, ὁμοίως ἔν τε τοῖς φύσει καὶ ἐν τοῖς ἀπὸ τέχνης, ὃ ἂν ᾖ κινητικόν), οὐ μὴν ἀλλὰ καὶ οὗτοι οὐκ ὀρθῶς λέγουσιν. τῆς μὲν γὰρ ὕλης τὸ πάσχειν ἐστὶ καὶ τὸ κινεῖσθαι, τὸ δὲ κινεῖν καὶ τὸ ποιεῖν ἑτέρας δυνάμεως—δῆλον δὲ καὶ ἐπὶ τῶν τέχνῃ καὶ ἐπὶ τῶν φύσει γινομένων· οὐ γὰρ αὐτὸ ποιεῖ τὸ ὕδωρ ζῷον ἐξ αὑτοῦ, οὐδὲ τὸ ξύλον κλίνην, ἀλλ' ἡ τέχνη—ὥστε καὶ οὗτοι

b 5 τοῖς] ἐν τοῖς H 6 ἕνεκα] ἕνεκεν E 7 ὁ secundum om. EL τῆς ἑκάστου] ἑκάστου τῆς HJ¹ : τῆς ἑκάστης J² δὲ om. E καὶ τὴν om. E 9 ἀλλ' οἱ μὲν om. E τὴν αἰτίαν F 10 τῷ om. E 14 μετάληψιν, litteris ληψι in litura scriptis, E 16 αὐτὴν] αὖ H 17 εἶναι om. F 19 καὶ τῶν εἰδῶν ἀεὶ om. E¹ 20 δ' om. HJ 21 ὄν om. F¹HJ γὰρ] om. J : γὰρ καὶ E 24 φήσειε] φήσηε E : φήσει HΦ¹Γ : φησὶν J : φήσι L 25 μὲν om. F λεγόντων] λεγομένων EL 28 φύσει] φυσικοῖς L ἐν secundum om. F ἀπὸ τέχνης ἀπὸ τέχνης δὲ F¹HJ, et (in margine) E² ᾖ] εἴη fecit E : post κινητικόν ponit F 30 τὸ quartum om. EL 32 ἐπὶ τῶν om. F οὐ] οὔτε HJ 32–33 ζῷον ἐξ ἑαυτοῦ H : ἐξ ἑαυτοῦ ζῷον F 33 οὐδὲ] οὔτε FHJ

διὰ τοῦτο λέγουσιν οὐκ ὀρθῶς, καὶ ὅτι παραλείπουσι τὴν κυριωτέραν αἰτίαν· ἐξαιροῦσι γὰρ τὸ τί ἦν εἶναι καὶ τὴν μορφήν. ἔτι δὲ καὶ τὰς δυνάμεις ἀποδιδόασι τοῖς σώμασι, δι' ἃς γεννῶσι, λίαν ὀργανικάς, ἀφαιροῦντες τὴν κατὰ τὸ εἶδος αἰτίαν. ἐπειδὴ γὰρ πέφυκεν, ὥς φασι, τὸ μὲν θερμὸν διακρίνειν τὸ δὲ ψυχρὸν συνιστάναι, καὶ τῶν ἄλλων ἕκαστον τὸ μὲν ποιεῖν τὸ δὲ πάσχειν, ἐκ τούτων λέγουσι καὶ διὰ τούτων ἅπαντα τἆλλα γίγνεσθαι καὶ φθείρεσθαι. φαίνεται δὲ καὶ τὸ πῦρ αὐτὸ κινούμενον καὶ πάσχον. ἔτι δὲ παραπλήσιον ποιοῦσιν ὥσπερ εἴ τις τῷ πρίονι καὶ ἑκάστῳ τῶν ὀργάνων ἀπονέμοι τὴν αἰτίαν τῶν γινομένων· ἀνάγκη γὰρ πρίοντος διαιρεῖσθαι καὶ ξέοντος λεαίνεσθαι, καὶ ἐπὶ τῶν ἄλλων ὁμοίως· ὥστ' εἰ ὅτι μάλιστα ποιεῖ καὶ κινεῖ τὸ πῦρ, ἀλλὰ πῶς κινεῖ οὐ προσθεωροῦσιν, ὅτι χεῖρον ἢ τὰ ὄργανα.

ἡμῖν δὲ καθόλου τε πρότερον εἴρηται περὶ τῶν αἰτίων, καὶ νῦν διώρισται περί τε τῆς ὕλης καὶ τῆς μορφῆς. ἔτι δὲ ἐπεὶ ἡ κατὰ τὴν φορὰν κίνησις δέδεικται ὅτι ἀΐδιος, ἀνάγκη τούτων ὄντων καὶ γένεσιν εἶναι συνεχῶς· ἡ γὰρ φορὰ ποιήσει τὴν γένεσιν ἐνδελεχῶς διὰ τὸ προσάγειν καὶ ἀπάγειν τὸ γεννητικόν. ἅμα δὲ δῆλον ὅτι καὶ τὸ πρότερον καλῶς εἴρηται, τὸ πρώτην τῶν μεταβολῶν τὴν φορὰν ἀλλὰ μὴ τὴν γένεσιν εἰπεῖν. πολὺ γὰρ εὐλογώτερον τὸ ὂν τῷ μὴ ὄντι γενέσεως αἴτιον εἶναι ἢ τὸ μὴ ὂν τῷ ὄντι τοῦ εἶναι· τὸ μὲν οὖν φερόμενον ἔστι, τὸ δὲ γινόμενον οὐκ ἔστιν—διὸ καὶ ἡ φορὰ προτέρα τῆς γενέσεως. ἐπεὶ δ' ὑπόκειται καὶ δέδεικται συνεχὴς οὖσα τοῖς πράγμασι γένεσις καὶ φθορά, φαμὲν δ' αἰτίαν εἶναι τὴν φορὰν τοῦ γίνεσθαι, φανερὸν ὡς μιᾶς μὲν οὔσης τῆς φορᾶς οὐκ ἐνδέχεται γίνεσθαι ἄμφω διὰ τὸ ἐναντία εἶναι (τὸ γὰρ αὐτὸ

a 1 δὲ om. H ἀποδιδόυσι, suprascr. *a*, J ἃς] ἃ E 2 ὀργανικάς EHLΦ: ὀργανικῶς FJΓ 3 ἐπειδὴ] ἐπεὶ FHJ φασι] φησιν E 7 καὶ secundum om. F 9 ἀπονέμη F 10 πρίοντος] πρίονος ὄντος L ξαίοντος F 11 κινεῖ καὶ ποιεῖ L 12 οὐ προσθεωροῦσιν fecit E: οὐ προθεωροῦσιν H: οὐχ ὁροῖσιν E^{1}: οὐχ ὁρῶσιν FLΓ 13 τε om. H: τὸ Φ^{1} 15 τὴν om. F 17 ἐντελεχῶς E: actualiter Γ 18 καὶ ἀπάγειν om. F γενητικόν E καὶ τὸ] καὶ τὰ FHJL πρότερον] πρῶτα F 19 τὴν om. E 21 εἶναι αἴτιον L ἢ om. E ἢ . . . 23 διὸ in marg. add. F 24 ante γένεσις add. καὶ EL 25 τὴν φορὰν om. E 26 ὡς] ὅτι H τῆς (ut videtur) om. E^{1}

καὶ ὡσαύτως ἔχον ἀεὶ τὸ αὐτὸ πέφυκε ποιεῖν, ὥστε ἤτοι γένεσις ἔσται ἀεὶ ἢ φθορά), δεῖ δὲ πλείους εἶναι τὰς κινήσεις καὶ ἐναντίας ἢ τῇ φορᾷ ἢ τῇ ἀνωμαλίᾳ—τῶν γὰρ ἐναντίων αἴτια τἀναντία. διὸ καὶ οὐχ ἡ πρώτη φορὰ αἰτία ἐστὶ γενέσεως καὶ φθορᾶς, ἀλλ' ἡ κατὰ τὸν λοξὸν κύκλον· ἐν ταύτῃ γὰρ καὶ τὸ συνεχὲς ἔνεστι καὶ τὸ κινεῖσθαι δύο κινήσεις· ἀνάγκη γάρ, εἴ γε ἀεὶ ἔσται συνεχὴς γένεσις καὶ 336b φθορά, ἀεὶ μέν τι κινεῖσθαι, ἵνα μὴ ἐπιλείπωσιν αὗται αἱ μεταβολαί, δύο δ', ὅπως μὴ θάτερον συμβαίνῃ μόνον. τῆς μὲν οὖν συνεχείας ἡ τοῦ ὅλου φορὰ αἰτία, τοῦ δὲ προσιέναι καὶ ἀπιέναι ἡ ἔγκλισις. συμβαίνει γὰρ ὁτὲ μὲν πόρρω γίνεσθαι ὁτὲ δ' ἐγγύς, ἀνίσου δὲ τοῦ διαστήματος ὄντος ἀνώμαλος ἔσται ἡ κίνησις, ὥστ' εἰ τῷ προσιέναι καὶ ἐγγὺς εἶναι γεννᾷ, τῷ ἀπιέναι ταὐτὸν τοῦτο καὶ πόρρω γίνεσθαι φθείρει, καὶ εἰ τῷ πολλάκις προσελθεῖν γεννᾷ, καὶ τῷ πολλάκις ἀπελθεῖν φθείρει—τῶν γὰρ ἐναντίων τἀναντία αἴτια, καὶ ἐν ἴσῳ χρόνῳ καὶ ἡ φθορὰ καὶ ἡ γένεσις ἡ κατὰ φύσιν. διὸ καὶ οἱ χρόνοι καὶ οἱ βίοι ἑκάστων ἀριθμὸν ἔχουσι καὶ τούτῳ διορίζονται. πάντων γάρ ἐστι τάξις, καὶ πᾶς χρόνος καὶ βίος μετρεῖται περιόδῳ, πλὴν οὐ τῇ αὐτῇ πάντες, ἀλλ' οἱ μὲν ἐλάττονι οἱ δὲ πλείονι· τοῖς μὲν γὰρ ἐνιαυτός, τοῖς δὲ μείζων, τοῖς δὲ ἐλάττων ἡ περίοδός ἐστι, τὸ μέτρον. φαίνεται δὲ καὶ κατὰ τὴν αἴσθησιν ὁμολογούμενα τοῖς παρ' ἡμῶν λόγοις· ὁρῶμεν γὰρ ὅτι προσιόντος μὲν τοῦ ἡλίου γένεσίς ἐστιν, ἀπιόντος δὲ φθίσις, καὶ ἐν ἴσῳ χρόνῳ ἑκάτερον· ἴσος γὰρ

a 29 *ἀεὶ ἔσται* EL *φορά* E^1J 30 *φθορᾷ* E 31 *αἴτια τὰ ἐναντία* F : *ἐναντία αἴτια* E : *τἀναντία αἴτια* L 32 *τῆς γενέσεώς ἐστι καὶ τῆς φθορᾶς* F 33 *ἔνεστι*] *ἐστι* EL *κινεῖσθαι δύο* om. E^1 34 *γε ἀεὶ*] *τε ἀεὶ* E : om. FH, et J qui tamen supra lin. (nescio an prima m.) add. **b** 1 *ἀεὶ*] *δεῖ* J *μέν* om. F *τι*] *τοι* L *ἐπιλιμπάνωσιν* E : *ὑπολίπωσιν* L 2 *συμβαίνει* J 4 *ἐγκλησις*, supra *η* ascripto *ι*, J 6 *προιέναι* E 7 *τῷ*] *καὶ τῷ* H : *καὶ ἐν τῷ* FL *ταὐτὸν τοῦτο*] *τὸ αὐτὸ τοῦτο* post *γίνεσθαι* ponunt H et (supra lineam add.) F : *τοῦτο αὐτὸ* post *γίνεσθαι* ponit J 8 *προσελθεῖν*] *προσιέναι* FHJ *καὶ* secundum om. F *πολλάκις ἀπελθεῖν*] *πολλάκις ἀπιέναι* F : *ἀπιέναι πολλάκις* fecit E^2 9 *τὰ ἐναντία* J (*τὰ* supra lin. prima manu addito) 10 *καὶ* prius om. HJΦ^1 *ἡ* ante *κατὰ* om. E 11 *ἑκάστων οὖν ἀριθμὸν* F^1 12 *βίος καὶ χρόνος* EL 13 *μετρᾶται* H *πάντες* om. E *πάντες . . .* 14 *πλείονι* om. L 14 *δὲ* prius om. E^1 *τοῖς μὲν*] *ἄλλοις μὲν* L 15 *τοῖς*] *ἄλλοις* F *ελαττον* J *τὸ* om. E 17 *λόγοις*] *λεγομένοις* F 18 *ἴσος*] *ἴσως* E

ὁ χρόνος τῆς φθορᾶς καὶ τῆς γενέσεως τῆς κατὰ φύσιν. ἀλλὰ συμβαίνει πολλάκις ἐν ἐλάττονι φθείρεσθαι †διὰ τὴν πρὸς ἄλληλα σύγκρασιν†· ἀνωμάλου γὰρ οὔσης τῆς ὕλης καὶ οὐ πανταχοῦ τῆς αὐτῆς ἀνάγκη καὶ τὰς γενέσεις ἀνωμάλους εἶναι καὶ τὰς μὲν θάττους τὰς δὲ βραδυτέρας· ὥστε συμβαίνει, διὰ ⟨τὸ⟩ τὴν τούτων γένεσιν ἄλλοις γίνεσθαι φθοράν. ἀεὶ δ', ὥσπερ εἴρηται, συνεχὴς ἔσται ἡ γένεσις καὶ ἡ φθορά (καὶ οὐδέποτε ὑπολείψει δι' ἣν εἴπομεν αἰτίαν), τοῦτο δ' εὐλόγως συμβέβηκεν. ἐπεὶ γὰρ ἐν ἅπασιν ἀεὶ τοῦ βελτίονος ὀρέγεσθαί φαμεν τὴν φύσιν, βέλτιον δὲ τὸ εἶναι ἢ τὸ μὴ εἶναι (τὸ δ' εἶναι ποσαχῶς λέγομεν, ἐν ἄλλοις εἴρηται), τοῦτο δ' ἐν ἅπασιν ἀδύνατον ὑπάρχειν διὰ τὸ πόρρω τῆς ἀρχῆς ἀφίστασθαι, τῷ λειπομένῳ τρόπῳ συνεπλήρωσε τὸ ὅλον ὁ θεός, ἐνδελεχῆ ποιήσας τὴν γένεσιν—οὕτω γὰρ ἂν μάλιστα συνείροιτο τὸ εἶναι διὰ τὸ ἐγγύτατα εἶναι τῆς οὐσίας τὸ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν. τούτου δ' αἴτιον, ὥσπερ εἴρηται πολλάκις, ἡ κύκλῳ φορά· μόνη γὰρ συνεχής. διὸ καὶ τἆλλα ὅσα μεταβάλλει εἰς ἄλληλα κατὰ τὰ πάθη καὶ τὰς δυνάμεις, οἷον τὰ ἁπλᾶ σώματα, μιμεῖται τὴν κύκλῳ φοράν· ὅταν γὰρ ἐξ ὕδατος ἀὴρ γένηται καὶ ἐξ ἀέρος πῦρ καὶ πάλιν ἐκ τοῦ πυρὸς ὕδωρ, κύκλῳ φαμὲν περιεληλυθέναι τὴν γένεσιν διὰ τὸ πάλιν ἀνακάμπτειν· ὥστε καὶ ἡ εὐθεῖα φορὰ μιμουμένη τὴν κύκλῳ συνεχής ἐστιν. ἅμα δὲ δῆλον ἐκ τούτων ὅ τινες ἀποροῦσιν, διὰ τί ἑκάστου τῶν σωμάτων εἰς τὴν οἰκείαν φερομένου χώραν ἐν τῷ ἀπείρῳ χρόνῳ οὐ διεστᾶσι τὰ σώματα· αἴτιον γὰρ τούτου ἐστὶν ἡ εἰς ἄλληλα μετάβασις. εἰ γὰρ ἕκαστον ἔμενεν ἐν τῇ αὑτοῦ χώρᾳ καὶ μὴ μετέβαλλεν ὑπὸ τοῦ πλησίον, ἤδη ἂν διεστήκεσαν· μεταβάλλει μὲν οὖν διὰ τὴν φορὰν διπλῆν οὖσαν, διὰ δὲ τὸ

b 19 φορᾶς E 20 διὰ . . . 21 σύγκρασιν suspecta 21 σύγκρασιν ἢ σύγκρουσιν· γέγραπται γὰρ διττῶς Φ^c 23 θᾶττον EL βραδυτέρας εἶναι ὥστε EL 24 συμβαίνειν J τὸ e coni. addidi 26 οὔτε ποτὲ L 27 ἀεὶ post 28 φύσιν ponit F 28 φαμεν ante 27 τοῦ ponit F τὸ secundum om. H 30 ἀδύνατον τὸ ἐν ἅπασιν E : ἀδύνατον ἐν ἅπασιν L 32 ἐντελεχῆ E 33 ἐγγυτάτω F 34 ἀεὶ om. H τούτου] τοῦτο F αἴτιον om. FH

a 1 ἡ] αἰτία ἡ H 4 γὰρ delendum notat J^2 5 τοῦ om. EL 7 εὐθεῖα τούτων φορὰ L 10 τὰ σύνθετα σώματα J εἰς] ἐπ' E 11 ἔμεινεν FH αὐτοῦ EFHL 12 μετέβαλεν H διειστήκεσαν H 13 φθορὰν E δὲ supra lin. add. J

μεταβάλλειν οὐκ ἐνδέχεται μένειν οὐδὲν αὐτῶν ἐν οὐδεμιᾷ χώρᾳ τεταγμένῃ.

διότι μὲν οὖν ἔστι γένεσις καὶ φθορὰ καὶ διὰ τίν' αἰτίαν, καὶ τί τὸ γενητὸν καὶ φθαρτόν, φανερὸν ἐκ τῶν εἰρημένων. ἐπεὶ δ' ἀνάγκη εἶναί τι τὸ κινοῦν εἰ κίνησις ἔσται, ὥσπερ εἴρηται πρότερον ἐν ἑτέροις, καὶ εἰ ἀεί, ὅτι ἀεὶ δεῖ τι εἶναι, καὶ εἰ συνεχής, ἓν τὸ αὐτὸ καὶ ἀκίνητον καὶ ἀγένητον καὶ ἀναλλοίωτον, καὶ εἰ πλείους αἱ ἐν κύκλῳ κινήσεις, πλείους μέν, πάσας δέ πως εἶναι ταύτας ἀνάγκη ὑπὸ μίαν ἀρχήν· συνεχοῦς δ' ὄντος τοῦ χρόνου ἀνάγκη τὴν κίνησιν συνεχῆ εἶναι, εἴπερ ἀδύνατον χρόνον χωρὶς κινήσεως εἶναι· συνεχοῦς ἄρα τινὸς ἀριθμὸς ὁ χρόνος, τῆς κύκλῳ ἄρα, καθάπερ ἐν τοῖς ἐν ἀρχῇ λόγοις διωρίσθη. συνεχὴς δ' ἡ κίνησις πότερον τῷ τὸ κινούμενον συνεχὲς εἶναι ἢ τὸ ἐν ᾧ κινεῖται, οἷον τὸν τόπον λέγω ἢ τὸ πάθος; δῆλον δὴ ὅτι τῷ τὸ κινούμενον (πῶς γὰρ τὸ πάθος συνεχὲς ἀλλ' ἢ τῷ τὸ πρᾶγμα ᾧ συμβέβηκε συνεχὲς εἶναι; εἰ δὲ καὶ τῷ ἐν ᾧ, μόνῳ τοῦτο τῷ τόπῳ ὑπάρχει, μέγεθος γάρ τι ἔχει)· τούτου δὲ τὸ κύκλῳ μόνον συνεχὲς ὥστε αὐτὸ αὑτῷ ἀεὶ συνεχές· τοῦτο ἄρα ἐστὶν ὃ ποιεῖ συνεχῆ κίνησιν, τὸ κύκλῳ σῶμα φερόμενον, ἡ δὲ κίνησις τὸν χρόνον.

Ἐπεὶ δ' ἐν τοῖς συνεχῶς κινουμένοις κατὰ γένεσιν ἢ ἀλλοίωσιν ἢ ὅλως μεταβολὴν ὁρῶμεν τὸ ἐφεξῆς ὂν καὶ γι- 337[b] νόμενον τόδε μετὰ τόδε ὥστε μὴ διαλείπειν, σκεπτέον πότερον ἔστι τι ὃ ἐξ ἀνάγκης ἔσται, ἢ οὐδέν, ἀλλὰ πάντα ἐνδέχεται μὴ γενέσθαι. ὅτι μὲν γὰρ ἔνια, δῆλον, καὶ εὐθὺς τὸ ἔσται καὶ τὸ μέλλει ἕτερον διὰ τοῦτο· ὃ μὲν γὰρ ἀληθὲς 11

a 15 διότι] ὅτι H 16 αἰτίαν εἴρηται καὶ EL 17, 21, 22, et infra 337[b] 13, 14, 16, 17, 19, 20, 21, 22, 24, 26, 28, 31, 32, 34, 35, 338[a] 2, 3, 4, 5 ἀνάγκη, ἀνάγκης] ἀναγκαῖον, ἀναγκαίου H 17 τὸ om. EFJΦ[1] κινοῦν] om. E, supra lin. add. J 18 ἐν] καὶ ἐν H εἰ om. E 18–19 ἀεὶ δεῖ τι] δεῖ τι ἀεὶ F : ἀεί τι δεῖ H 19 συνεχές E 20 ἀγένητον FL αἱ ἐν] εἷεν αἱ HL 21 ἀνάγκη om. EL 23 χωρὶς] ἄνευ FHJ : γρ. ἄνευ E : cf. *Phys.* 218[b] 33, 219[a] 1 24 ὁ χρόνος ἀριθμός F τῆς] τοῖς J 25 λόγοις om. F διώρισται H ἡ om. HJ 26 ἢ] καὶ F ἢ τῷ τὸ L 28 τὸ post γὰρ supra lin. add. J ἀλλ' ἢ fecit E 29 ᾧ prius supra lin. (prima tamen, ut videtur, manu) add. E τῷ] τὸ FH 30 ἐνυπάρχει L 31 τὸ αὐτὸ F ἀεὶ om. EL 32 ἄρα] γὰρ F b 2 τι ὃ] ὅ τι EF : ὃ om. J[1] ἔσται] ἐστιν J 3–4 τὸ ὃ ἔσται coni. Bywater 4 μέλλει e coni. scripsi : cf. Φ[c] (Vitelli 302. 25 et 306. 12) : μέλλον codd. omnes et Φ[1]

εἰπεῖν ὅτι ἔσται, δεῖ τοῦτο εἶναί ποτε ἀληθὲς ὅτι ἔστιν, ὃ δὲ νῦν ἀληθὲς εἰπεῖν ὅτι μέλλει, οὐδὲν κωλύει μὴ γενέσθαι— μέλλων γὰρ ἂν βαδίζειν τις οὐκ ἂν βαδίσειεν. ὅλως δ', ἐπεὶ ἐνδέχεται ἔνια τῶν ὄντων καὶ μὴ εἶναι, δῆλον ὅτι καὶ γινόμενα οὕτως ἕξει, καὶ οὐκ ἐξ ἀνάγκης τοῦτ' ἔσται. πότερον οὖν ἅπαντα τοιαῦτα; ἢ οὔ, ἀλλ' ἔνια ἀναγκαῖον ἁπλῶς γενέσθαι, καὶ ἔστιν ὥσπερ ἐπὶ τοῦ εἶναι τὰ μὲν ἀδύνατα μὴ εἶναι, τὰ δὲ δυνατά, οὕτως καὶ περὶ τὴν γένεσιν, οἷον τροπὰς ἄρα ἀνάγκη γενέσθαι καὶ οὐχ οἷόν τε μὴ ἐνδέχεσθαι; εἰ δὴ τὸ πρότερον ἀνάγκη γενέσθαι εἰ τὸ ὕστερον ἔσται, οἷον εἰ οἰκία, θεμέλιον, εἰ δὲ τοῦτο, πηλόν· ἆρ' οὖν καὶ εἰ θεμέλιος γέγονεν, ἀνάγκη οἰκίαν γενέσθαι; ἢ οὐκέτι, εἰ μὴ κἀκεῖνο ἀνάγκη γενέσθαι ἁπλῶς; εἰ δὲ τοῦτο, ἀνάγκη καὶ θεμελίου γενομένου γενέσθαι οἰκίαν· οὕτω γὰρ ἦν τὸ πρότερον ἔχον πρὸς τὸ ὕστερον, ὥστ' εἰ ἐκεῖνο ἔσται, ἀνάγκη ἐκεῖνο πρότερον· εἰ τοίνυν ἀνάγκη γενέσθαι τὸ ὕστερον, καὶ τὸ πρότερον ἀνάγκη, καὶ εἰ τὸ πρότερον, καὶ τὸ ὕστερον τοίνυν ἀνάγκη—ἀλλ' οὐ δι' ἐκεῖνο, ἀλλ' ὅτι ὑπέκειτο ἐξ ἀνάγκης ἐσόμενον. ἐν οἷς ἄρα τὸ ὕστερον ἀνάγκη εἶναι, ἐν τούτοις ἀντιστρέφει καὶ ἀεὶ τοῦ προτέρου γενομένου ἀνάγκη γενέσθαι τὸ ὕστερον. εἰ μὲν οὖν εἰς ἄπειρον εἶσιν ἐπὶ τὸ κάτω, οὐκ ἔσται ἀνάγκη τῶν ὕστερον τοδὶ γενέσθαι ἁπλῶς, ἀλλ' ἐξ ὑποθέσεως· ἀεὶ γὰρ ἕτερον ἔμπροσθεν ἀνάγκη ἔσται δι' ὃ ἐκεῖνο ἀνάγκη γενέσθαι, ὥστ' εἰ μή ἐστιν ἀρχὴ τοῦ ἀπείρου, οὐδὲ πρῶτον ἔσται οὐδὲν δι' ὃ ἀναγκαῖον ἔσται γενέσθαι. ἀλλὰ μὴν οὐδ' ἐν τοῖς πέρας ἔχουσι τοῦτ' ἔσται εἰπεῖν ἀληθῶς, ὅτι ἁπλῶς ἀνάγκη γενέσθαι, οἷον οἰκίαν, ὅταν θεμέλιος γένη-

b 5 ἔσται] ἔστιν E 7 γὰρ ἀναβαδίζειν E βαδίσειεν] βαδίση F δ'] τε Φ^1 8 ἐπεὶ] ἐπειδὴ FJΦ^1 9 τὰ γινόμενα HJL 10 οὖν] δὲ F τοιαῦτα] ταῦτα F 11 γίνεσθαι EL 12 δυνατόν F τὴν om. J 13 ἆρα] ἄρα Bonitz, fort. recte 14 δή] δὲ H 15 οἰκίαν L 16 οἰκίαν] οἰκία E : καὶ οἰκίαν FHJ οὐκέτι] οὐκ ἐστιν F^1 18 οἰκείαν E γὰρ ἂν ἦν F 19 ὥστ'] ὡς H ἐστιν FJ 20 ante εἰ add. γενέσθαι FHJL 21 καὶ . . . πρότερον in marg. add. EFJ 25 εἰ . . . 338ª 9 γενομένων] de hoc loco, v. Alexandri ἀ. κ. λ. ii. 22 (Bruns, pp. 71, 72) 25 τω κάτω E^1 26 τῶν E^1JL et Alex. l. c. : τὸ E^2FH τοδὶ scripsi, cf. Φ^1 (codd. RZ) : τόδε codd. omnes, Φ^1 (codd. GT), et Alex. l. c. ἀλλ' ἐξ EJ, et Alex. l. c. : ἀλλ' οὐδ' ἐξ HLΦ^c : οὐδ' supra lin. add. etiam F 27 δι' ὃ] διὸ καὶ FJ 29 δι' ὃ] διὸ FJ 30 ἐστιν F 31 ὅταν θεμέλιος γένηται om. E^1

ται· ὅταν γὰρ γένηται, εἰ μὴ ἀεὶ τοῦτο ἀνάγκη γίνεσθαι, συμβήσεται ἀεὶ εἶναι τὸ ἐνδεχόμενον μὴ ἀεὶ εἶναι. ἀλλὰ δεῖ τῇ γενέσει ἀεὶ εἶναι, εἰ ἐξ ἀνάγκης ἐστὶν αὐτοῦ ἡ γένεσις. τὸ γὰρ ἐξ ἀνάγκης καὶ ἀεὶ ἅμα (ὃ γὰρ εἶναι ἀνάγκη
338a οὐχ οἷόν τε μὴ εἶναι), ὥστ' εἰ ἔστιν ἐξ ἀνάγκης, ἀΐδιόν ἐστι, καὶ εἰ ἀΐδιον, ἐξ ἀνάγκης· καὶ εἰ ἡ γένεσις τοίνυν ἐξ ἀνάγκης, ἀΐδιος ἡ γένεσις τούτου, καὶ εἰ ἀΐδιος, ἐξ ἀνάγκης. εἰ ἄρα τινὸς ἐξ ἀνάγκης ἁπλῶς ἡ γένεσις, ἀνάγκη ἀνακυκλεῖν καὶ ἀνακάμπτειν. ἀνάγκη γὰρ ἤτοι πέρας ἔχειν τὴν γένεσιν ἢ μή, καὶ εἰ μή, ἢ εἰς εὐθὺ ἢ κύκλῳ. τούτων δ', εἴπερ ἔσται ἀΐδιος, οὐκ εἰς εὐθὺ οἷόν τε διὰ τὸ μηδαμῶς εἶναι ἀρχήν (μήτ' ἂν κάτω ὡς ἐπὶ τῶν ἐσομένων λαμβανομένων, μήτ' ἄνω ὡς ἐπὶ τῶν γενομένων)· ἀνάγκη δ' εἶναι ἀρχήν . . . † μήτε πεπερασμένης οὔσης † ἀΐδιον εἶναι· διὸ ἀνάγκη κύκλῳ εἶναι. ἀντιστρέφειν ἄρα ἀνάγκη ἔσται, οἷον εἰ τοδὶ ἐξ ἀνάγκης, καὶ τὸ πρότερον ἄρα· ἀλλὰ μὴν εἰ τοῦτο, καὶ τὸ ὕστερον ἀνάγκη γενέσθαι. καὶ τοῦτο ἀεὶ δὴ συνεχῶς—οὐδὲν γὰρ τοῦτο διαφέρει λέγειν διὰ δύο ἢ πολλῶν. ἐν τῇ κύκλῳ ἄρα κινήσει καὶ γενέσει ἐστὶ τὸ ἐξ ἀνάγκης ἁπλῶς· καὶ εἴτε κύκλῳ, ἀνάγκη ἕκαστον γίνεσθαι καὶ γεγονέναι, καὶ εἰ ἀνάγκη, ἡ τούτων γένεσις κύκλῳ. ταῦτα μὲν δὴ εὐλόγως, ἐπεὶ ἀΐδιος καὶ ἄλλως ἐφάνη ἡ κύκλῳ κίνησις καὶ ἡ τοῦ οὐρανοῦ, ὅτι ταῦτα ἐξ ἀνάγκης γίνεται καὶ ἔσται, ὅσαι ταύ-
338b της κινήσεις καὶ ὅσαι διὰ ταύτην· εἰ γὰρ τὸ κύκλῳ κινού-

b 32 *ἀνάγκη ἀεὶ γίνεσθαι τοῦτο* F 33 *τὸ* LΦ^{c} (Vitelli 305. 5 et 310. 30) : om. EFHJ *μὴ ἀεὶ*] *ἀεὶ μὴ* F *ἀλλὰ . . .* 34 *εἶναι* om. E^{1} 34 *αὐτοῦ ἐστιν* EL a 2 *καὶ εἰ ἡ γένεσις τοίνυν* om. E, spatio tamen relicto 3 *ἡ*] *καὶ ἡ* H *εἰ* om. E 4 *ἀνακυκλεῖν*] *περικυκλεῖν* HJ : *περι ἀνακυκλεῖν* F 6 *εἰ μή, ἢ*] *ἢ* fecit E (in loco plurium capace) : *ἢ* H : *εἰ μὴ* FJ 8 et 9 *ὡς* om. E et Alex. l. c. 8 *λαμβανομένων* EFHJ et Alex. l. c. : *λαμβάνομεν* L 9 *ἂν ἄνω* Alex. l. c. *γεινομένων* E : *γινομένων* H et Alex. l. c. *ἀρχή* E^{1} 10 post *ἀρχήν* excidisse quaedam suspicor *μήτε . . . οὔσης* corrupta *μήτε*] *μὴ* L *πεπερασμένης οὔσης*] *πεπερασ οὔσης* E. Fort. *ἐπὶ πέρας ἐχούσης*, vel *ἐπὶ πεπερασμένης εὐθείας* (cf. Φ^{c}, Vitelli 312. 1), scribenda post *οὔσης* add. *καὶ* FHL 11 *ἀντιστρέφει* J *τοδὶ*] *τὸ* EJ^{2} 12 *εἶναι καὶ τὸ πρότερον* FHJ *ἄρα* supra lin. (prima tamen, ut videtur, manu) add. J *τὸ* secundum om. E 13 *δὴ*] *ἤδη* FHJ *οὐδὲν*] *οὐδὲ* E 14 *γὰρ τοῦτο* om. E : *τοῦτο* om. Φ^{1} (codd. RZ), Φ^{c} *πολλῶν*] *πλειόνων* Φ 16 *ἕκαστον* om. F *γίνεσθαι*] *γενέσθαι* HJ 18 *ἐφάνη καὶ ἄλλως* F 19 *ταῦτα*] *ταύτας* H b 1 *τὸ*] *τι* HJ, et F qui *τὸ* ante *κύκλῳ* in marg. add.

μενον ἀεί τι κινεῖ, ἀνάγκη καὶ τούτων κύκλῳ εἶναι τὴν κίνησιν—οἷον τῆς ἄνω φορᾶς οὔσης ὁ ἥλιος κύκλῳ ὠδί, ἐπεὶ δ' οὕτως, αἱ ὧραι διὰ τοῦτο κύκλῳ γίνονται καὶ ἀνακάμπτουσιν, τούτων δ' οὕτω γινομένων πάλιν τὰ ὑπὸ τούτων. τί οὖν δή ποτε τὰ μὲν οὕτω φαίνεται, οἷον ὕδατα καὶ ἀὴρ κύκλῳ γινόμενα, καὶ εἰ μὲν νέφος ἔσται, δεῖ ὗσαι, καὶ εἰ ὗσει γε, δεῖ καὶ νέφος εἶναι, ἄνθρωποι δὲ καὶ ζῷα οὐκ ἀνακάμπτουσιν εἰς αὐτοὺς ὥστε πάλιν γίνεσθαι τὸν αὐτόν (οὐ γὰρ ἀνάγκη, εἰ ὁ πατὴρ ἐγένετο, σὲ γενέσθαι· ἀλλ' εἰ σύ, ἐκεῖνον), εἰς εὐθὺ δὲ ἔοικεν εἶναι αὕτη ἡ γένεσις; ἀρχὴ δὲ τῆς σκέψεως πάλιν αὕτη, πότερον ὁμοίως ἅπαντα ἀνακάμπτει ἢ οὔ, ἀλλὰ τὰ μὲν ἀριθμῷ τὰ δὲ εἴδει μόνον. ὅσων μὲν οὖν ἄφθαρτος ἡ οὐσία ἡ κινουμένη, φανερὸν ὅτι καὶ ἀριθμῷ ταὐτὰ ἔσται (ἡ γὰρ κίνησις ἀκολουθεῖ τῷ κινουμένῳ), ὅσων δὲ μὴ ἀλλὰ φθαρτή, ἀνάγκη τῷ εἴδει, ἀριθμῷ δὲ μὴ ἀνακάμπτειν. διὸ ὕδωρ ἐξ ἀέρος καὶ ἀὴρ ἐξ ὕδατος εἴδει ὁ αὐτός, οὐκ ἀριθμῷ· εἰ δὲ καὶ ταῦτα ἀριθμῷ, ἀλλ' οὐχ ὧν ἡ οὐσία γίνεται, οὖσα τοιαύτη οἷα ἐνδέχεσθαι μὴ εἶναι.

b 3 κύκλῳ ὁ ἥλιος F, Bonitz ὠδί om. E ἐπεὶ . . . 4 ἀνακάμπτουσιν in marg. add. F 4 οὕτως] οὗτος J : οὗτος οὕτως Bonitz αἱ om. E 5 δ' om. E πάλιν τὰ] πάνθ' F : πάντα L 6 φαίνονται J ὕδατα] ὕδωρ LΦ1 7 γίγνομενος FJ2 δεῖ καὶ ὗσαι FHJΦ1 8 καὶ prius om. HJ 9 αὐτοὺς codd. omnes : ἑαυτοὺς Φ1 10 ὁ om. E 11 δὲ prius] δὴ L et (in litura) J δὲ secundum] δὴ HJ 15 ταῦτα ἓν ἔσται HJ : ταυτὰ ἓν ἔσται F 16 ὅσων] ὅσον E 18 ταῦτα] ταὐτὰ J 19 ἡ om. F1 ἐνδέχεσθαι] ἐνδέχεται FJ

COMMENTARY

A. 1

14ª 1–6. Περὶ . . . ὀνόμασιν. A rough sketch of the subject-matter of the work. Cf. Introd. §§ 7–11; and below, * 20ᵇ 34—21ª 29, * 21ᵇ 16–17, * 27ª 32–34, * 28ᵇ 22.

14ª 1. δέ. On the systematic connexion of this work with the *de Caelo*, see Introd. § 11. The δέ is supposed to answer the μὲν οὖν in the last sentence of the *de Caelo* (313ᵇ 21), cf. Philoponos and Zabarella.

φύσει, to exclude the products of τέχνη and the results of προαίρεσις (Philoponos).

14ª 2. ὁμοίως κατὰ πάντων. Aristotle proposes to treat of γένεσις and φθορά in general, as πάθη predicable uniformly of (i.e. as processes exhibited uniformly by) all the γεννητὰ καὶ φθαρτά in nature. The scope of his present inquiry does not include an investigation of these processes in the special forms which they assume in the different kinds of perishable natural bodies, e. g. in the plants and animals: see Introd. § 11. For ὁμοίως, cf. * 18ª 25–27, 35ª 26.

14ª 2–3. τάς . . . αὐτῶν. αὐτῶν, sc. γενέσεως καὶ φθορᾶς. We shall find Aristotle distinguishing and explaining the formal, material, efficient, and final causes of these processes: hence διαιρετέον. In Book I he gives their nominal definitions, i. e. defines the meaning of the terms (cf. Introd. p. xxvi, note 1; p. xxx): their adequate scientific definitions (τοὺς λόγους) are to be gathered from the discussions in Book II, from which we can obtain an exact conception of their cause (cf. Introd. § 9).

14ª 3–6. ἔτι . . . ὀνόμασιν. The scope of the work includes a similar treatment of αὔξησις and ἀλλοίωσις. Aristotle, as we shall see, restricts the term αὔξησις, as he here investigates it, to the growth of τὰ ἔμψυχα. We must therefore not press ὁμοίως κατὰ πάντων (ª 2) as regards αὔξησις. The meaning of ἀλλοίωσις will appear later. The problem whether γένεσις and ἀλλοίωσις are two distinct processes, or one only, is expressly mentioned, because many of Aristotle's predecessors identified them, i. e. denied that there was any 'coming-to-be' proper: cf. next note.

14ª 6—17ª 31. τῶν . . . φασιν. Zabarella's account of the general

purport of this passage is right. The review of the theories of the early philosophers in Chapter 1 shows that it is a matter of dispute whether *γένεσις* and *φθορά are*, i. e. occur as facts distinct from *ἀλλοίωσις*; and it is therefore necessary explicitly to discuss *εἰ ἔστι γένεσις*, and to prove *ὅτι ἔστι* (cf. 15ª 26–27). But even those philosophers, who *did* distinguish *γένεσις* from *ἀλλοίωσις*, misunderstood *γένεσις*. For *γένεσις* is the emergence of a new substance (cf. 17ª 20–22), and not—as they supposed—the 'association' e. g. of 'indivisible bodies' (or 'indivisible surfaces') to form an aggregative whole. Hence the long discussion in Chapter 2 of the theories of Leukippos and Demokritos (and incidentally of the cognate theory of Plato) is primarily directed to show that *σύγκρισις* and *διάκρισις* cannot be identified with *γένεσις* and *φθορά*, although they may facilitate the latter processes. The proof *ὅτι ἔστιν ἡ γένεσις* (i. e. that the emergence of a new substance occurs in fact) begins with Chapter 3.

14ª 6 – ᵇ 8. *τῶν . . . μιγέντων. Outline*:—The ancient philosophers may be grouped as (i) those who recognized only one elementary substance, and (ii) those who recognized more than one. The monists are logically bound to identify, and the pluralists to distinguish, *γένεσις* and *ἀλλοίωσις* (ª **6–13**). It is only because Anaxagoras failed to understand the logical implications of his own statements, that he *appears* to be an exception to this rule. He *says* that *γένεσις* and *φθορά* are identical with *ἀλλοίωσις*, and yet he is a pluralist no less than Empedokles, Leukippos, and Demokritos. These philosophers are all pluralists, though their theories differ, and though the theory of Empedokles is actually 'contrary' to that of Anaxagoras (ª **13** – ᵇ **1**). The monists *must* identify *γένεσις* and *ἀλλοίωσις*, because all change must, on their view, be the modification of a single persistent *substratum*. The pluralists *must* distinguish *γένεσις* and *ἀλλοίωσις*, because *γένεσις* and *φθορά* result, on their view, from the 'consilience' and 'dissolution' of the Many—as in fact Empedokles says (ᵇ 1–8).

14ª 6–7. *τὴν . . . γένεσιν*, 'the so-called "unqualified coming-to-be".' Cf. *τὰ καλούμενα στοιχεῖα*, *22ᵇ 1–2, 28ᵇ 31. According to the monists the so-called *ἁπλῆ γένεσις* is really *ἀλλοίωσις*. Similarly, according to Aristotle, the so-called 'elements' (Earth, Air, Fire, and Water) are really derivative.

14ª 9. *καὶ . . . γεννῶσι.* Explanatory of *ὅσοι . . . λέγουσι*. Thales, e. g., said that 'the universe was one something', in the sense that all things were made out of Water.

14ª 13–15. καίτοι . . . ἀλλοιοῦσθαι. Anaxagoras accused the Hellenes of miscalling the facts: *οὐδὲν γὰρ χρῆμα γίνεται οὐδ' ἀπόλλυται, ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεταί τε καὶ διακρίνεται. καὶ οὕτως ἂν ὀρθῶς καλοῖεν τό τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι* (fr. 17; Diels, pp. 320–1). At first sight, this *dictum*, since it identifies *γένεσις* and *φθορά* with *σύμμιξις* and *διάκρισις*, *distinguishes γένεσις* from *ἀλλοίωσις*: for Anaxagoras's view looks like the views of Empedokles and Leukippos. But Aristotle's interpretation is justified by the peculiar character of *τὰ ἐόντα χρήματα* in Anaxagoras's system, which gives a special meaning to *σύμμιξις* and *διάκρισις*. Cf. e. g. fr. 1, 4, 10, 12 (Diels, pp. 313–18) and Arist. *Phys.* 187ª 26–30.

It is difficult to reproduce the force of *γε* (ª 13): perhaps 'Anaxagoras himself failed to understand his own utterance'—viz. statements like that in fr. 17. *ἠγνόησεν* i. q. *non intellexit* (Bonitz, *Ind.* s. v.). It is Anaxagoras who misuses language. If he had understood his own utterance, he could not also have said that the elements were many.

14ª 15. καθάπερ καὶ ἕτεροι, 'in common with others', e. g. those whom Aristotle has quoted as typical pluralists.

14ª 17. τὰ . . . ἀριθμόν. *τὰ κινοῦντα* are Love and Strife (*Φιλότης* and *Νεῖκος*). Empedokles conceived them as corporeal elements (cf. * 33ª 19–20; Burnet, p. 232) as Aristotle is well aware. Still it is natural enough to call Earth, Air, Fire, and Water *τὰ σωματικά* in his system *par excellence*.

14ª 19. τὰ ὁμοιομερῆ. In Aristotle's system the *ὁμοιομερῆ* are the first, or most rudimentary, compound natural bodies (Introd. § 11). Every *ὁμοιομερές* is a chemical compound of the same four 'simple' bodies (Earth, Air, Fire, Water) or—more precisely—of the same four 'elementary qualities' (Hot, Cold, Dry, Moist). The four constituents enter into combination in a determinate quantitative proportion, which differs in the different *ὁμοιομερῆ*; so that each *ὁμοιομερές* is characterized by its distinctive 'combining-formula' (*λόγος τῆς μίξεως*). Under the head of *ὁμοιομερῆ* are included the metals, wood and bark in plants, bone, flesh, marrow, blood, &c., in animals. Such compounds are called *ὁμοιομερῆ*, because (however far they may be subdivided) each portion retains the character of the whole: bone, e. g., will not cease to be bone by subdivision, but only by chemical analysis. In Aristotle's system the *ὁμοιομερῆ* are intermediate between the 'simple' bodies and the *ἀνομοιομερῆ* or *ὄργανα*, each of

which is a complex of different ὁμοιομερῆ. An eye, e. g., or a hand, is a σύνθεσις of many different ὁμοιομερῆ. (Cf. * 21ᵇ 19–22, A. 10, B. 1–3, 7, 8 with the notes: and my paper on 'Aristotle's conception of chemical combination' in the *Journal of Philology*, No. 57.)

Aristotle employs his own technical terms in his accounts of the views of his predecessors. Thus the terms ὕλη and στοιχεῖον were not used by Empedokles, Leukippos, Demokritos, or Anaxagoras, though Aristotle's statements here and elsewhere might lead us to suppose that they were (cf. Burnet, § 14, § 130). Similarly there is no evidence that Anaxagoras used the term ὁμοιομερῆ. He *may* have used the term ὁμοιομέρειαι, but even that is doubtful. We know, however, that Aristotle applies the term ὁμοιομερῆ to what Anaxagoras called σπέρματα (cf. *de Caelo* 302ª 31 – ᵇ 3), but we do not know how far the characteristics of the Aristotelian ὁμοιομερῆ attach to Anaxagoras's 'seeds'. Were the σπέρματα πάντων χρημάτων (cf. e. g. fr. 4; Diels, p. 315) ὁμοιομερῆ merely in the sense that each 'seed' retained its distinctive character however minutely it was subdivided, and is this all that Aristotle meant to imply? Or were the 'seeds'—either in Anaxagoras's own intention, or at least in Aristotle's interpretation—quantitatively different combinations of the same contrary 'qualities'?

It is impossible to answer this question with any certainty. The reader should consult Burnet (§§ 127–31) and Carlo Giussani's edition of Lucretius (1896, vol. ii, pp. 147–50). These are, so far as I know, the best attempts to reconstruct Anaxagoras's theory of matter: but neither of them is completely successful, since each leaves some of the fragments inexplicable.

14ª 20. τῶν . . . ἐστίν: 'everything else which is such that part and whole are the same in name and nature.' For συνώνυμα λέγεται ὧν τό τε ὄνομα κοινὸν καὶ ὁ κατὰ τοὔνομα λόγος τῆς οὐσίας ὁ αὐτός, *Cat.* 1ª 6.

14ª 21–24. Δημόκριτος . . . τούτων. According to Leukippos and Demokritos the 'indivisible bodies', or 'atoms', are infinite in number and infinitely various in shape. Everything else in the universe is put together out of these atoms: and the compounds (αὐτά, ª 23) differ from one another because of (i) a difference in the shape, or (ii) a different position or 'turning', or (iii) a different ordering or 'grouping', of the component atoms. (Cf. *Metaph.* 985ᵇ 15–19; also below, 15ᵇ 6–15, 15ᵇ 33—16ª 2, * 25ᵇ 36—26ª 24.)

αὐτὰ πρὸς αὐτά (EJL) is clearly right, and is accepted by Diels

(p. 345). The compounds differ 'one as compared with another', not 'as compared with themselves'. For the idiom, cf. perhaps *ἄλλο πρὸς ἄλλο*.

For *θέσει* (i. q. *τροπῇ*) and *τάξει* (i. q. *διαθιγῇ*), cf. * 15^{b} 33—16^{a} 2.

14^{a} 24. γάρ. There is no sufficient reason to desert EJ and read *δέ* for *γάρ*. The logical connexion is rather complicated, but it is not made clearer by *δέ*. The comparison of Anaxagoras with the Atomists (^{a} **18–24**) is parenthetical, and at ^{a} **24** Aristotle returns to justify the original statement (^{a} **16–18**) that Empedokles postulates six elements, whilst Anaxagoras postulates an infinite number. The statement is correct, 'for the views of the school of Anaxagoras seem diametrically opposed to those of the followers of Empedokles', &c. (^{a} **24** – ^{b} **1**). It is assumed throughout that the *ὁμοιομερῆ* are infinite in number, as indeed Anaxagoras says with regard to his *σπέρματα* (fr. 4; Diels, p. 315).

14^{a} 24 – ^{b} 1. ἐναντίως . . . τούτων. Cf. *de Caelo* 302^{a} 28 – ^{b} 5. Aristotle *there* says that Anaxagoras (i) regarded Air and Fire as *μίγματα* of all the *ὁμοιομερῆ*, i. e. of all the 'seeds', (ii) used the term 'Aether' for Fire, and (iii) held therefore that all things come-to-be out of Air and Fire (cf. fr. 1; Diels, pp. 313-14).

Nothing in the fragments justifies Aristotle's assertion *here* that Earth and Water (as well as Air and Fire) are each a *πανσπερμία*. On the contrary, Aristotle's statement appears to conflict with fr. 4 (Diels, p. 315), where Earth seems to be on the same level of simplicity as the 'contraries' and the 'seeds'.

14^{a} 27–28. σάρκα . . . ὁμοιομερῶν, 'flesh, bone, and bodies which, like these, are "homoeomeries"': cf. 14^{a} 19–20, and *de Caelo*, l. c., *τὰ γὰρ ὁμοιομερῆ στοιχεῖα* (*λέγω δ' οἷον σάρκα καὶ ὀστοῦν καὶ τῶν τοιούτων ἕκαστον*).

14^{a} 29. πανσπερμίαν. This appears to be a technical term of Demokritos: cf. *de Anima* 404^{a} 1–5, *Phys.* 203^{a} 18–23. But it is probable enough that Anaxagoras used it, since he used the term *σπέρματα* (Burnet, p. 265$_{2}$). The same meaning is expressed in the *de Caelo*, l. c., by the words *ἀέρα δὲ καὶ πῦρ μίγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων*.

14^{b} 3. μένειν, sc. 'for they must affirm that the underlying something always remains . . .' It is not necessary to read *μένει* (cf J Φ^{1}) with Bonitz.

14^{b} 3–4. τὸ δὲ τοιοῦτον, sc. *τὸ μεταβάλλειν τοῦ αὐτοῦ καὶ ἑνὸς μένοντος, τοῦ ὑποκειμένου δηλονότι* (Philoponos).

14^{b} 7–8. λέγει . . . μιγέντων. *καὶ Ἐμπεδοκλῆς*, i. e. Empe-

dokles as well as Anaxagoras (cf. 14ª 14). Aristotle is abbreviating Empedokles, fr. 8 (Diels, p. 175). The words *μίξις . . . μιγέντων* are quoted again below, cf. *33ᵇ 15–16. In spite of Burnet's ingenious interpretation of fr. 8 (cf. Burnet, p. 205₄), I think that by *φύσις* Empedokles there means 'coming-to-be', or at least that Aristotle so understands him. For *φύσις* = *γένεσις*, cf. *Phys.* 193ᵇ 12.

14ᵇ 8–12. ὅτι . . . λεγόμενα. Aristotle recapitulates, and prepares to criticize, the pluralist position. 'It is clear (i) that to describe coming-to-be and passing-away in these terms is in accordance with their fundamental assumption, and (ii) that they do in fact so describe them.'

ὁ λόγος, sc. the description of *γένεσις* and *φθορά* as a consilience and dissociation of the many elements. *τῇ ὑποθέσει*, viz. their assumption that there are more elements than one. *καὶ τούτοις*, i. e. 'the pluralists as well as ordinary people', e. g. as well as Aristotle himself. Aristotle appeals in confirmation to ordinary experience: *ὁρῶμεν*, ᵇ 13.

14ᵇ 12–13. τοῦτο . . . συνιδεῖν. *τοῦτο*, sc. that the pluralists (i) *must* recognize *ἀλλοίωσις* as a distinct fact from *γένεσις*, and (ii) *cannot* do so consistently with their statements. The first point is established (ᵇ 13–15) by an appeal to the obvious facts of perception: and the second point is argued ᵇ 15–26.

14ᵇ 15–26. οὐ μὴν . . . ἀλλοίωσις. This argument is intended to apply to all the pluralists, since Aristotle has set out to prove that their statements are incompatible with the recognition of *ἀλλοίωσις*. Yet, at ᵇ 20, he quotes Empedokles, and thenceforward proceeds as if Empedokles alone were in question. Thus, though he speaks as if *all* 'those who posit more "original reals" (*ἀρχάς*, ᵇ 16) than one' regarded the *πάθη* involved in *ἀλλοίωσις* as constitutive of their 'elements', he offers no evidence of this assertion except so far as it applies to Empedokles.

14ᵇ 17. τὰ . . . συμβαίνειν. Aristotle here assumes his own theory of *ἀλλοίωσις*, viz. that it is a process in which a perceptible *substratum* passes from one *πάθος* to another contrasted *πάθος*. The *πάθη* in question are the *παθητικαὶ ποιότητες* of the *Categories* (9ª 28 ff.). Cf. *17ª 23–27, *19ᵇ 6—20ª 7, *19ᵇ 8–10, *31ª 8–10.

14ᵇ 20. Ἐμπεδοκλῆς. Cf. fr. 21, vv. 3 and 5 (Aristotle omits v. 4); Diels, p. 180.

14ᵇ 22. τῶν λοιπῶν, sc. *στοιχείων*, or possibly (as Philoponos interprets) *παθῶν*.

14^b 23–24. ὥστ' . . . γῆν. *μὴ δυνατόν*, sc. according to Empedokles: cf. * 15^a 4–8.

14^b 24. ἔσται, sc. *δυνατὸν γίνεσθαι*.

14^b 25–26. τοῦτο . . . ἀλλοίωσις. 'Yet this is what Alteration essentially is.' For ἦν, cf. * 28^b 2, 31^b 23.

14^b 26—15^a 3. ἢ . . . ἀλλοίωσις. Two corollaries. (i) Every change (viz. Alteration, Growth and Diminution, and Motion) takes place between contrary poles (cf. * 19^b 6—20^a 7); these contrary poles must be informations of a single matter. (ii) If A alters into B, A and B must be modifications of a single *substratum*: and, conversely, if A and B are modifications of a single *substratum*, change of A into B (or *vice versa*) is Alteration.

The second corollary (14^b 28 ἔτι . . . 15^a 3 ἀλλοίωσις) is not very clearly expressed. Aristotle appears to mean that so far as any changing things have a single *substratum*, their change is Alteration: and *vice versa*. The position of the monists (14^b 1–4) is an extreme case, where *all* things are modifications of a single *substratum*, and (correspondingly) *all* change is Alteration.

15^a 3–25. Ἐμπεδοκλῆς . . . φύσιν. Not only does Empedokles so conceive his elements that ἀλλοίωσις becomes impossible (14^b 17–26); his whole position is in conflict with the facts and full of inconsistency.

15^a 4–8. ἅμα . . . ἕκαστον. According to Empedokles, the four 'roots' (Earth, Air, Fire, and Water) were eternal and unchangeable: cf. * 25^b 19–25, 29^b 1, 33^a 16–18; Burnet, p. 230. There is no coming-to-be or passing away: cf. fr. 8; 12; 17, v. 34; 21, v. 13 (Diels, pp. 175, 176, 179, 181). 'Love', when it has obtained the mastery, brings all things together into one, viz. into the 'Sphere'; but it does not make a unity of them, but only a 'together'. Aristotle substitutes for the 'all-togetherness' of Empedokles an 'all-oneness', i. e. he interprets the statement about Love bringing all things *into one* as if it meant that Love reduces all things to *the One*. But even when all things are together in the 'Sphere', the four roots remain 'what they were' and unreduced (cf. Burnet, p. 235_4). Hence Aristotle's charge of *inconsistency* depends upon a misinterpretation. No doubt, he thought that the irreducibility of Empedokles' elements was in conflict with the plain facts: for he regarded the transmutation of Earth, Air, Fire, and Water into one another as given in experience. But that is another matter.

15^a 8–11. ὥστ' . . . σκληρόν. Assuming that in the 'Sphere' all

things are fused into a unity, Aristotle urges that, when Love begins to go out and Strife to come in, the elements come into being as distinct things. For an 'addition' and 'subtraction' of the *πάθη* which distinctively characterize the elements then occur: so that, whereas e.g. Moist and Hot were originally distributed uniformly over the 'Sphere', Hot is *now* added *here* and subtracted *there*, Moist subtracted *here* and added *there*. Hence *this* portion becomes separated from *that*, *this* being distinctively Moist (i.e. Water) and *that* distinctively Hot (i.e. Fire).

15^a 9. **χωριζομένων**: genitive absolute, the implied subject being various portions of the 'Sphere', two of which are specified (*τὸ μὲν . . . τὸ δέ*) as the subjects of the main sentence. For the construction, cf. 15^b 3; Bonitz, *Ind.* 149^b 37-45 and commentary on *Metaph.* 990^b 14. Just below (^{a} 16) *χωρίζεσθαι* is applied to the *πάθη*.

15^a 14. **οὐ . . . νῦν.** *τότε*, sc. at the period when Empedokles seems to recognize that the elements come-to-be, viz. when Love first begins to go out of the 'Sphere' and Strife to come in.

νῦν, sc. at the period in which we are living, i.e. when Strife is gaining the mastery (cf. 34^a 6–7; Burnet, pp. 234–5).

15^a 15–19. **ἔστι . . . πᾶν.** *ἔστι δυνάμενα*, sc. *τὰ πάθη*.

According to Empedokles, it was the conflict between Strife and Love which caused the separation of the qualities when the disintegration of the 'Sphere' first began. Hence we have a right to infer that the qualities can be 'added' and 'subtracted' in the present state of the world too, since that conflict is still going on.

15^a 17–19. **διόπερ . . . πᾶν.** 'It was owing to this conflict of Love and Strife that they' (i.e. the elements) 'were generated from a One at the former period also. I say "generated", for presumably Fire, Earth, and Water had no distinctive existence at all while merged in one.'

It is necessary for Aristotle to justify his use of the term *ἐγεννήθησαν*, since Empedokles asserts that the elements are eternal. Bekker reads *ὕδωρ ἔτι ὄντα* in ^{a} 19, which he wrongly attributes to HL. H has some illegible characters under *ὕδωρ*: otherwise there is no trace of anything between *ὕδωρ* and *ὄντα*.

15^a 22. **μεταβάλλοντα . . . κίνησιν.** The 'Motion' is the *διάκρισις* initiated by Strife: but Empedokles is severely criticized below (33^b 22—34^a 9) for the vagueness and inadequacy of his account of *κίνησις*.

A. 2

15ª 26–28. Ὅλως . . . ἀλλοιώσεως. Cf. * 14ª 6—17ª 31. The real problem is:—How many distinct forms of change are there, and how precisely are they distinguished from one another? Are there three forms of change—Coming-to-be, Growth, Alteration—differing from one another in principle? And, if so, what is the distinctive manner of their occurrence?

15ª 27–28. περὶ . . . κινήσεις. It is difficult, if not impossible, to defend the accusative here, since the examples are in the genitive. Perhaps Aristotle wrote *περὶ τῆς ἄλλης κινήσεως*. The reading of D^b (*περὶ τῶν ἄλλων κινήσεων*) is an obvious attempt to emend the text. E adds *ἁπλᾶς* after *ἄλλας* (cf. also F and Γ): but this has probably arisen from a mere dittography of *ἄλλας*. For the distinction between *ἁπλαῖ* and *μικταὶ κινήσεις* (cf. *de Caelo* 302^b 6, 303^b 5, and also *Metaph.* 1053^a 9) is between 'simple' and 'composite' *movements* (cf. Introd. § 10) and is totally irrelevant here. There is no manuscript authority for *περὶ τῶν ἄλλων ἁπλῶν κινήσεων*—the reading of Bekker and Prantl.

15ª 29–33. Πλάτων . . . πράγμασιν. Cf. Plato, *Timaeus* 52 d ff., where the *γένεσις* of the physical universe in its present orderly constitution is described. God shapes and orders the chaotic material, controlling it with figures and numbers, and bringing it into conformity with the Intelligible Pattern. In particular, God develops Earth, Air, Fire, and Water into their present distinctive characters out of their pre-existing chaotic rudiments. Each of these bodies, as the work of God has fashioned them, consists of particles whose shape is that of one of the 'regular' solids: and these solids are constructed out of planes whose ultimate components belong to one or the other of two types of triangle (cf. * 16^a 2–4, *25^b 19–25, * 29^a 13–24).

Later on in the *Timaeus* (73 b ff.) Plato describes the *γένεσις* of 'flesh, bone, and the like'. He regards them as developed out of *μυελός*, which is itself formed by God out of selected elementary triangles by a process of *μίξις*. He does not, however, explain wherein precisely God's 'mixing' of the triangles consists; and his account of the formation of bone and flesh from the *μυελός* (73 e ff.) is fanciful, and anything but precise. At the same time, it might fairly be said that Aristotle's own account of the *γένεσις* of the *ὁμοιομερῆ* is equally vague. The difference between e. g. flesh and bone is a difference of the combining-formulae: but

we are never told *what exactly* the λόγος τῆς μίξεως of σάρξ or of ὀστοῦν is.

15ª 32. τῶν τοιούτων, sc. τῶν ὁμοιομερῶν, cf. * 14ª 27–28.

15ª 34–35. περὶ οὐδενὸς . . . περὶ ἁπάντων. It is clear both from the neuter, and from the examples (15ᵇ 1–6), that Aristotle is accusing his predecessors of neglecting to explain 'every one of the problems which the subject involves' (e. g. μίξις, ποιεῖν καὶ πάσχειν, ἀφή) and not merely of neglecting to explain the different forms of change.

15ª 35 – ᵇ 1. οὗτος . . . διαφέρειν. 'Demokritos, however, does seem not only to have thought carefully about all the problems, but also to be distinguished from the outset by his method.' The superiority of his method is explained below, 16ª 6 ff.

15ᵇ 1–6. οὔτε . . . ποιήσεις. These lines expand and enforce 15ª 34 (ὅλως . . . ἐπέστησεν). Aristotle himself discusses the manner of the accession of new material in Growth (A. 5), ποιεῖν καὶ πάσχειν (A. 7–9), and μίξις (A. 10). For the construction of προσιόντος, cf. * 15ª 9.

15ᵇ 6–9. Δημόκριτος . . . ἀλλοίωσιν. Cf. * 14ª 21–24. Aristotle's statement here must not be taken as meaning that the Atomists made no use of differences of figure in explaining the different 'secondary' qualities: see * 15ᵇ 33—16ª 2.

The Atomists appear to have called their 'indivisible bodies' σχήματα or ἰδέαι: cf. Burnet, p. 336.

15ᵇ 9–10. ἐπεὶ . . . φαίνεσθαι. Cf. 25ª 23–24, *de Anima* 404ª 25–31, *Metaph.* 1009ᵇ 11–17. In the last passage Demokritos is represented *first* as arguing from the conflicting appearances of sense 'that there is either nothing true, or what is true is not clear to us': and *next* as supposing that 'to know' is to perceive and 'to perceive' is to be changed in bodily state, and so concluding that 'what appears on the evidence of the senses must be true'. In the *de Anima* (l. c.) he is said to have identified ψυχή (i. e. the source of movement and sensation) and νοῦς, 'for τὸ ἀληθές is identical with τὸ φαινόμενον'.

It does not seem possible to extract from the fragments of Demokritos a consistent view as to (i) the 'reality' of the 'secondary' qualities, and (ii) the capacity of αἴσθησις and thought to attain to truth. We are told that flavours, colours, and perhaps temperature, are only by 'convention' (νόμῳ): whilst in reality (ἐτεῇ) there are 'atoms' and the 'void'. Yet the 'secondary' qualities are explained as due to differences in the figure, 'grouping'

and 'turning' of the atoms: and differences of *flavour* at any rate are treated as being *really* differences of figure (cf. * 15^{b} 33—16^{a} 2, * 25^{b} 36—26^{a} 24). And although Demokritos condemns the 'bastard' (σκοτίη) knowledge of sense and contrasts it with the 'true-born' (γνησίη) knowledge of the understanding, he also denies that we can know anything as it really is and criticizes the understanding on the ground that it depends on the senses: cf. fr. 6–11, 117, 125 (Diels, pp. 388–9, 407–8).

15^{b} 11. ἄπειρα, infinite both in number and in variety: cf. 14^{a} 22.

15^{b} 11–15. ὥστε . . . γραμμάτων. 'Hence—owing to the changes of the compound—*the same* thing seems different and conflicting to different people: it is transposed by a small additional ingredient, and appears utterly other by the transposition of a single constituent. For Tragedy and Comedy are both composed of *the same* letters.'

Tragedy and Comedy, though utterly contrasted in their effects on us, are really 'the same thing', i. e. composed of the same letters. The constituents are the same: the change is a change of the 'compound'. Similarly the same atoms, as constituting different perceptible things (different compounds), present conflicting appearances. The addition of a small ingredient (e. g. of a single new atom) may cause the original constituents to shift their places: and the transposition of even a single atom involves a 'change of the compound', and is thus enough to make the whole appear entirely different.

The illustration from Tragedy and Comedy is probably quoted from the Atomists (cf. Diels, *Elementum*, p. 13). Philoponos gives other examples, which seem to be drawn from Demokritos: but his interpretation of συγκειμένου as τοῦ συντιθέντος τὸ σύνθετον is impossible. Apart from the grammatical difficulty, Demokritos would never have admitted that the Atom itself changes.

15^{b} 15–24. ἐπεὶ . . . πειρατέον. Leukippos, Demokritos, Anaxagoras, and Empedokles (according to Aristotle) maintain *both* that γένεσις is distinct from ἀλλοίωσις, *and* that γένεσις and φθορά are respectively an 'associating' and a 'dissociating' of elementary constituents, whilst ἀλλοίωσις is a change of the thing's qualities. If we develop the logical implications of these theses, we shall find ourselves entangled in ἀπορίαι—dilemmas, antinomies. An ἀπορία is a pair of incompatible conclusions, both of which seem

to follow from logically convincing arguments. It is therefore like a tangle, or a knot, by which our intelligence is bound and enmeshed. We can neither accept nor reject it: and we cannot advance until we have 'unravelled' one or more of the arguments which form the knot (cf. e.g. *Metaph.* 995^{a} 30–33, *E. N.* 1146^{a} 24–27: Bonitz, *Ind.* s.v. διαλύειν, 184^{a} 43 ff.; Burnet, *Ethics*, Introd. § 25).

15^{b} 20–24. εἰ . . . πειρατέον: a somewhat hasty outline of the main ἀπορίαι to which the two theses lead. Thus (a) we *cannot* identify γένεσις and σύγκρισις, for many impossible consequences result from the identification. And yet we *must* identify them, for convincing arguments compel us to do so. (b) We *must* identify γένεσις and σύγκρισις: for if we do not, we shall have to choose between denying γένεσις altogether, and identifying it with ἀλλοίωσις.

The second ἀπορία (b) is an indirect proof that γένεσις must be σύγκρισις by a *reductio ad absurdum*. 'If γένεσις is not σύγκρισις, a dilemma results, both limbs of which conflict with the pluralists' first thesis: for either there is no γένεσις at all, or it is identical with ἀλλοίωσις.' Hence, *if we still wish to maintain that coming-to-be is not 'association'*, 'we must endeavour to unravel this dilemma too' (i. e. as well as the λόγοι ἕτεροι ἀναγκαστικοί referred to at 15^{b} 21), 'and a stubborn one we shall find it'.

The proposed interpretation involves the omission of εἰ (with EHJ) in ^{b} 24, as a dittograph of ἤ. A possible alternative is to retain εἰ, and omit ὄν (with ΕΓ, cf. H) as a reduplication of the last syllable of χαλεπόν:—'Or, however difficult it may be to unravel this dilemma too, we must make the attempt'.

15^{b} 26–27. τῶν . . . ἀδιαιρέτων, 'because the primary reals are indivisible magnitudes': cf. ^{b} 28 εἰ μεγέθη, 'if the primary reals are indivisible magnitudes . . .'

15^{b} 28. διαφέρει . . . πλεῖστον. If the primary reals are indivisible magnitudes, γένεσις *must* take place by σύγκρισις. If there are no indivisible magnitudes, γένεσις *need not* (though it still *may*) take place by σύγκρισις (Philoponos).

15^{b} 30. ἐν τῷ Τιμαίῳ. *Timaeus* 53 c ff.: cf. * 15^{a} 29–33, and below.

15^{b} 31. ἐν ἄλλοις. Cf. *de Caelo* Γ. 1, 7, Δ. 2, where Plato's theory is criticized. The paradox (cf. *de Caelo* Γ. 1, 299^{a} 6–11) consists in stopping at planes (μέχρι ἐπιπέδων): for the same principles, which induce Plato to resolve bodies into planes, ought

to have led him to resolve planes into lines and lines into points, and thus to have constructed bodies out of points or monads.

15^{b} 33—16^{a} 2. ὅμως . . . χρωματίζεσθαι. Cf. 14^{a} 21–24, 15^{b} 6–15, 25^{a} 23 – ^{b} 5. We have sufficient evidence to justify Aristotle's statement that the Atomists explained *γένεσις* and *φθορά* by *σύγκρισις* and *διάκρισις*. They admitted as *real* an infinite plurality of 'indivisible bodies' (atoms), imperceptible owing to their minuteness, differing from one another in figure and size, and moving in the 'void' (which is also 'real' in a sense: cf. * 25^{a} 26–32) in all directions and with different velocities. The perceptible things of ordinary experience 'come-to-be', because many atoms of congruous figures are brought together by their movements. Being brought together, they 'hold together' in so far as they get entangled or mechanically attached (e. g. hooked together). And when their cohesion is overcome – e. g. by a more powerful movement of the surrounding atoms—the perceptible thing 'passes-away'. (Cf. Diels, pp. 343 § 1, 346 §§ 14–15, 359 § 37; Burnet, *Greek Philosophy*, §§ 77–83.)

On the other hand, there is considerable obscurity in the Atomists' theory of the 'secondary' qualities of the perceptible things (colour, sound, flavour, temperature, &c.) and consequently in their conception of the change of such qualities, i. e. in their account of *ἀλλοίωσις* (cf. * 15^{b} 9–10, * 25^{b} 34—26^{b} 6). The 'secondary' qualities, though 'conventional' and not 'real', have a *real* basis in the figures, the sizes, the 'grouping' and the 'turning' of the constituent atoms; and some of them at least (e. g. flavours) appear to be explained as *really* differences of figure (cf. Arist. *de Sensu* 442^{b} 10–12, below * 25^{b} 36—26^{a} 24; Theophr. *de Sensu*, §§ 60–82, quoted by Diels, pp. 375–9). Now, if different flavours are *really* different figures, how can there be a change of flavour, i. e. *ἀλλοίωσις* in the qualities of taste? The atoms do not change their figure. Are we to suppose that a change in the 'grouping' or 'turning' of the atoms makes their figures *appear* different? But there is no indication that Demokritos distinguished between *real* and *apparent* figure, or that he ascribed flavour to *apparent* figure. Perhaps Demokritos would have appealed to the principle enunciated above (15^{b} 11–15). When milk, e. g., 'alters' from sweet to sour, what has *really* happened is that a few atoms of one figure have gone out of the compound and been replaced by atoms of a different figure.

But if so, is there any difference in principle between *ἀλλοίωσις* and *γένεσις* or *φθορά*?

At ^{b}33, EJ read *ὁμοίως*; but *ὅμως* is clearly required. The Atomists' technical terms for *σχῆμα*, *θέσις*, and *τάξις* were *ῥυσμός*, *τροπή*, and *διαθιγή* (*Metaph.* 985^{b} 15–19). Diels (p. 710, note on p. 344, l. 4) interprets *διαθιγή* as 'inter-contact'. Beare (p. 37_{2}) suggests it may be *διαθῑγή*, i. e. a dialectic form of *διαθήκη* (sc. *διάθεσις*). EJLΦ^{c} read *διαθηγῇ* here (^{b}35): but, in view of 27^{a} 18 (*διαθιγῇ* FHJ, om. E, *διαθηγῆ* L), we should hardly be justified in introducing *διαθηγῇ* or *διαθήκῃ*. For *μετακινοῦντα*, cf. 15^{b} 13, 14.

16^{a} 1–2. διὸ . . . χρωματίζεσθαι. A parenthetical corollary. Demokritos is entitled to deny the 'reality' of colour, since (according to his theory) things get coloured owing to the 'turning' of their constituent atoms. Demokritos appears to have recognized black, white, green, and red as primary colours, out of which all other colours were formed by mixture (Beare, pp. 30–7). He also seems to have identified 'white' with 'smooth' and 'black' with 'rough' (Arist. *de Sensu* 442^{b} 11–12): and the present passage suggests that the 'smoothness' or 'roughness' depends upon the way in which the atoms are turned. The things which get coloured—or which appear coloured, owing to the 'turning' of their atoms—are the objects of vision, i. e. the 'images' (*δείκελα* or *εἴδωλα*) thrown off from bodies (Burnet, *Greek Philosophy*, p. 196).

Theophrastos, however, represents Demokritos as ascribing the differences of texture (e. g. smoothness and roughness) in the objects of vision to differences of figure in the atoms, and not merely to differences of their 'turning': cf. Theophr. *de Sensu*, §§ 73–82 (Diels, pp. 377–9). In 16^{a} 1 HJ read *χροιήν*, which Diels (p. 715) rejects as probably not a genuine survival of the dialect.

16^{a} 2–4. τοῖς . . . αὐτῶν. The Platonists cannot, with their assumptions, construct *ἀλλοίωσις* as well as *γένεσις*. Nothing but solids results from 'putting together' planes: but *ἀλλοίωσις* means change of qualities, and therefore presupposes qualities in the things which alter. And it is impossible to generate a quality by 'putting together' planes—the Platonists do not even attempt it. The last clause (*πάθος γὰρ . . . αὐτῶν*) supports the clause before it (*οὐδὲν γὰρ . . . συντιθεμένων*), which itself justifies Aristotle's assertion that the Platonists cannot construct *ἀλλοίωσις* as well as *γένεσις*.

L and F (in the margin) read *συντιθεμένων κατὰ πλάτος*, which

would mean 'by being superimposed' (cf. *de Caelo* 299^{b} 23–31). But the elementary triangles of the *Timaeus* are not *superimposed* to form the 'elements'. They are 'put together' so as to constitute the planes containing a solid, i. e. they are 'put together' κατὰ γραμμήν. We must reject κατὰ πλάτος as the addition of a scribe, who misunderstood Aristotle's criticisms both here and in the *de Caelo*, l. c.

16^{a} 8. συνείρειν: intransitive, cf. 18^{a} 13, *Phys.* 262^{a} 16.

16^{a} 8–10. οἱ . . . ῥᾷον: '. . . those whom devotion to abstract discussions has rendered unobservant of the facts are too ready to dogmatize on the basis of a few observations.'

λόγοι, sc. dialectical discussions: cf. 16^{a} 11 (λογικῶς), *Metaph.* 987^{b} 31, 1050^{b} 35.

τὰ ὑπάρχοντα, sc. 'the facts' as contrasted with *a priori* theories: cf. Bonitz, *Ind.* s.v., who rightly quotes *de Caelo* 297^{b} 22, *Post. Anal.* 81^{b} 23 in illustration of the present passage.

16^{a} 12. οἱ . . . ἔσται. The Platonists argue that there must be atomic magnitudes, 'because otherwise "The Triangle" will be more than one'. For their argument, cf. *de Lin. Insec.* 968^{a} 9–14 with my notes.

In ^{a} 12, ὅτι αὐτὸ τὸ τρίγωνον (E) is on the whole the most probable reading. J's οὐ φασί is an obvious correction due to misunderstanding of διότι.

16^{a} 13–14. Δημόκριτος . . . προϊοῦσιν. The 'arguments appropriate to the subject, i. e. drawn from the science of nature', which convinced Demokritos, are reproduced and answered in the discussion which follows.

16^{a} 14—17^{a} 17. ἔχει . . . ἐλαττόνων. (i) The thesis that a body is divisible through and through (i. e. the denial of indivisible magnitudes) leads to impossible results. Hence we seem to be forced to *maintain* that there are indivisible magnitudes (16^{a} 14–^{b} 16). But (ii) the latter thesis also leads to impossible results, as Aristotle claims to have shown elsewhere. Hence we seem forced to *deny* that there are indivisible magnitudes (16^{b} 16–18).

We are thus entangled in an ἀπορία (cf. * 15^{b} 15–24), and this is solved by showing that the arguments, which apparently compel us to accept indivisible magnitudes, involve a faulty inference (16^{b} 18—17^{a} 17).

16^{a} 14. ἀπορίαν. The term is used rather loosely here: 'a difficulty'. But an ἀπορία in the full and strict sense is developed in the following passage: cf. 16^{b} 19, and the preceding note.

16ª 15–16. εἴ τις . . . δυνατόν. The denial of indivisible magnitudes is equivalent to the thesis that 'a body (i. e. a magnitude) is divisible through and through'. But this thesis, *if interpreted without careful qualification*, leads (as we shall see) to the absurdity that the constituents of a body are either 'points' or 'nothings':— or that there is nothing in the body which escapes the division, i. e. that the whole body is consumed in the dividings.

16ª 17–18. κἂν . . . διῄρηται. It is tempting to omit τοῦτο in ª 18 (with Φ^1), since it must mean τὸ σῶμα, whereas in ª 16 and ª 17 it means τὸ πάντῃ διαιρεθῆναι. F reads . . . τοῦτο πάντῃ διηρημένον, καὶ εἰ μὴ ἅμα τοῦτο διῄρηται. The addition of πάντῃ, though it gives the right sense, is unnecessary, and is probably due to the πάντῃ in ª 17. And the second τοῦτο only tends to throw suspicion on the first.

Translate: 'then it might be at one and the same moment divided through and through, even though the dividings had not been effected simultaneously'.

16ª 19. κἂν . . . ἀδύνατον. Cf. 27ª 7–14, where Aristotle refers to the present passage. His argument presupposes the definition of τὸ δυνατόν which is given in the *Metaphysics* (1047ª 24–26):— 'A thing is δυνατόν so far as, if it actually does (or is) that which it has the power to do (or be), nothing ἀδύνατον results'. By ἀδύνατον we must understand 'inconceivable', 'self-contradictory' (cf. e. g. *Metaph.* 1047ᵇ 3–14). Hence x is δυνατὸν εἶναι y, provided that, if x actually is (or becomes) y, the 'being' of x is not *eo ipso* destroyed; i. e. provided that y is not incompatible with some feature constitutive of the essential nature of x.

So, a body is πάντῃ διαιρετόν (i. q. δυνατὸν πάντῃ διαιρεθῆναι), provided that, if in fact this 'through and through' division takes place, nothing incompatible with the essential nature of 'body' results. But, as we shall see, the body's dissolution into points would result: i. e. it would follow that a body 'consists of points', which *is* incompatible with the essential nature of 'body'. Hence a body is not δυνατὸν πάντῃ διαιρεθῆναι in the proper sense of δυνατόν.

It must, however, be added that Aristotle here interprets the thesis (that a body is πάντῃ διαιρετόν) as meaning that a body can be *so* divided through and through, that the results of the dividing are *simultaneous*. It would not follow that a body 'consists of points', if the thesis meant only 'it is always possible to divide a given body anywhere, though not everywhere at once'.

The thesis thus interpreted is, in fact, maintained by Aristotle himself.

Aristotle developed his conception of *δύναμις* and *δυνατόν* in the *Metaph.* (l. c.) as the result of a controversy with the Megarians: see, on the whole subject, Maier's article in the *Archiv f. Geschichte d. Philosophie*, xiii, pp. 30 ff.

16ª 19–21. οὐκοῦν . . . γεγονός. 'Hence the same principle will apply, whenever a body is by nature divisible through and through —whether by progressive bisection, or generally by any method whatever: nothing impossible will have resulted, if it has actually been divided . . .'

The construction is a little harsh, but not impossible. Aristotle is urging that if a body is *δυνατὸν πάντῃ διαιρεθῆναι*, whether the *διαίρεσις* is by bisection (*κατὰ τὸ μέσον*, i. e. by *progressive* bisection *ad infinitum*: cf. ª 18 *καὶ εἰ μὴ ἅμα διῄρηται*), or by any other method (*καὶ ὅλως δέ*), *in all cases alike* nothing *ἀδύνατον* will result if the body has actually been divided. Bekker and Prantl make nonsense of the passage by placing a full stop after *ὡσαύτως*.

For this use of *οὐκοῦν*, see Bonitz, *Ind.* 540ª 28–30, and cf. below, 16ᵇ 10.

16ª 22. διῃρημένα ⟨διαιρεθ⟩ῇ. An alternative emendation would be *διῃρημένα ⟨διῃρημένον⟩ ᾖ*.

16ª 25. ἦν . . . διαιρετόν, 'whereas *ex hypothesi* the body was divisible *through and through*'. Aristotle is reproducing the original formulation of the thesis (16ª 15): otherwise we should have expected *διῃρημένον* instead of *διαιρετόν*.

16ª 25–26. ἀλλὰ . . . δ' ἔσται. 'But if it be admitted that neither a body nor a magnitude will remain, and yet "through and through" division is to take place . . .'

Εἰ μηδὲν ἔσται (sc. *λοιπόν*) *σῶμα μηδὲ μέγεθος* resumes the result of the preceding argument as an admission which the advocates of the original thesis are forced to make. *διαίρεσις δ' ἔσται* reaffirms the original thesis in spite of this admission. If the original thesis is to be maintained in spite of this admission, the body, which is *πάντῃ διαιρετόν*, will have to consist of points or of nothings, as Aristotle proceeds to state.

16ª 26–34. ἢ . . . μέγεθος. The constituents of the body must be either (i) points, or (ii) nothings. If (i) they are *points*, they are without magnitude; and therefore the body, which they constitute, can have no magnitude, i. e. cannot be *ποσόν* (ª **29–34**). If (ii) they are *nothings*, the body can come-to-be out of nothings,

and can exist as a composite of nothings: i. e. the body is simply an illusory appearance (ª **28–29**).

The explanatory clause *καὶ ἀμεγέθη ἐξ ὧν σύγκειται* has disturbed the natural statement of the alternatives. Aristotle began with the intention of writing 'it will either consist of points or of nothings'. But he added to the first alternative the explanatory clause 'i. e. its constituents will be *ἀμεγέθη*'; and then, treating this clause as if it were the main statement of the first alternative, stated the second alternative in a corresponding grammatical form. Thus the effect is the same as if he had written *ἢ στιγμαὶ ἔσονται καὶ ἀμεγέθη ⟨τὰ⟩ ἐξ ὧν σύγκειται, ἢ οὐδὲν παντάπασιν.*

16ª 29–34. ὁμοίως . . . μέγεθος: this disposes of the *first* alternative (see preceding note). The argument (ª **30–34**) is:— (i) Before the division, when the points were in contact and together, they did not increase the quantity of the whole (ª **30–31**, *ὁπότε . . . τὸ πᾶν*). We can see this (ii) from the fact that, when the body was divided into two or more parts, the whole (i. e. the sum of the now separated parts) was not a bit smaller or bigger than it was before the division (ª **31–33** *διαιρεθέντος . . . πρότερον*). Hence (iii) even if all the points (into which the body has been dissolved by the 'through and through' division) be put together, they will not make any magnitude.

16ª 34 – ᵇ 8. ἀλλὰ . . . στιγμήν. We have seen that, if a body has been divided through and through, we are left with points or nothings: i. e. the body has been dissolved into 'constituents' which never could constitute it. But it might be urged that, though nothing is left when the 'through and through' division is over, yet *in the process of the dividing* something evades the division: and that this 'something' sufficed to constitute the original body. It is suggested *first* (ª **34 – ᵇ 2**) that the 'something' which evades the division is itself a 'body', like sawdust: and when that suggestion is disposed of, it is suggested *next* (ᵇ **2–8**) that the original body was 'formed' or 'qualified' points, and that the 'form' or the 'quality' goes out in the dividing. This suggestion also is shown to be impossible.

16ᵇ 2. ἀπέρχεται . . . διαιρετόν; *ἀπέρχεται* (and similarly *ἀπῆλθεν*, ᵇ 3) i. q. *τὴν διαίρεσιν διαφεύγει*, 16ª 16.

ὁ αὐτὸς λόγος: the same argument as above, ª 24–25.

ἐκεῖνο . . . διαιρετόν; 'For *in what sense* is that section divisible? It must be divisible in some sense, since the body is *πάντῃ διαιρετόν*.

EHJL omit γάρ, but the asyndeton is rather harsh.

16^{b}4. στιγμαὶ . . . παθοῦσαι. The 'points' or 'contacts' stand to the πάθος in the relation of matter to form. The μέγεθος is a τόδε ἐν τῷδε, or ὡδὶ ταδὶ ἔχοντα (cf. *Metaph.* 1036^{b}23). The suggestion, then, is that the division separates the points or contacts (the matter) from their πάθος (the form), and that in the division an εἶδός τι χωριστὸν ἢ πάθος goes out.

Before proceeding, it will be as well to explain certain technical terms (viz. ἐφεξῆς, ἁπτόμενον, ἐχόμενον, συνεχές), whose meaning Aristotle assumes throughout this passage and in what follows. They are defined in the *Physics* (226^{b}18—227^{b}2 : cf. also 231^{a}18 ff., and *de Lin. Insec.* 971^{a}17—972^{a}6 with my notes).

(i) The widest term is ἐφεξῆς. It applies whenever there is a series with a first member (an ἀρχή) and an order of 'succession', provided that there is nothing of the same kind (συγγενές) as the members of the series intervening between any two of them. In every such series each succeeding member is *consecutive* (ἐφεξῆς) to the preceding member. Thus, e. g., a line (or lines) may be *consecutive* to a line, a unit (or units) to a unit, a house (or houses) to a house, provided that no other magnitude, no other number, or no other building intervenes.

The members constituting the series may be selected on various principles ; e. g. because they belong to the same species as the first member ('a row of houses'), because they have a determinate spatial relation to it ('a series of lines parallel to a given line'), and so forth. And, in relation to the selected ἀρχή, the 'succession' may be *temporal* (e. g. the 2nd of the month is consecutive to the 1st), or '*logical*' (the number 2 is consecutive to 1, for 1 is πρότερον τῷ λόγῳ to 2), or *spatial* (the second house in the row is consecutive to the first), &c.

(ii) If, in a consecutive series, any member is *in contact with* the member to which it is consecutive, it is said to be 'immediately next' (ἐχόμενον) to its predecessor.

Now, according to Aristotle's definition of τὸ ἅπτεσθαι (*Phys.* 226^{b}21–23, and cf. * 22^{b}29), only spatial *quanta* (lines, surfaces, or solids) can strictly be *in contact*. Any two lines, surfaces, or solids are *in contact* when their 'extremes' (i. e. their containing points, lines, or surfaces) are 'together' (ἅμα), viz. are in one and the same 'immediately-continent' place. The 'immediately-continent' place of anything (τόπος ἴδιος or πρῶτος) is that which

contains that thing and nothing more (*Phys.* 209a 31 – b 1). Hence the term *immediately-next* (ἐχόμενον) applies only to a series of consecutive spatial *quanta*. In such a series any member which is *in contact with* the preceding member (to which it is *consecutive*) is *immediately-next* to it. Thus, though the number 2 is *consecutive* to 1, 2 is not *immediately-next* to 1: for numbers cannot be *in contact with* one another. And though point may be said, in a less strict sense of ἅπτεσθαι, to be *in contact with* point; yet, since in a magnitude point is not *consecutive* to point, point cannot be said to be *immediately-next* to point (cf. * 16b 6–8, * 17a 2–17).

Lastly (iii) τὸ συνεχές is a special case of ἐχόμενον. If the 'extremes' of two *quanta* (one of which is immediately-next to the other), instead of being merely 'together' (ἅμα), coalesce and become one, the *quanta* are 'held together' or 'continued' (συνέχεται) and are *continuous* or form a *continuum* (συνεχές).

In order to prevent misunderstanding, it must be remembered that Aristotle regards *continuity* as primarily spatial, i.e. as characterizing a μέγεθος. The 'continuity' of motion, or of change generally, is derivative, dependent upon the continuity of the moving or changing σῶμα. And the 'continuity' of time is dependent upon the 'continuity' of the κίνησις which, *qua* measured, is time. Similarly 'succession' (τὸ πρότερον καὶ ὕστερον), according to Aristotle, is primarily spatial, depending upon position (τῇ θέσει). Cf. *Phys.* 219a 10 ff., 220b 24 ff.; below, * 37a 22–25.

We can now explain 16b 4 a little further. The advocates of the 'through and through' divisibility of a μέγεθος may urge (Aristotle suggests) that a μέγεθος is 'points or contacts *thus* qualified': i.e. a continuous magnitude, they may say, results from the coalescence of two points, which are ἅμα, into one point. Each couple of 'coincident' points is a 'contact' (ἁφή): and a 'contact', or many 'contacts', whose 'coincident' points fuse and become one, *is* a συνεχές.

16b 5–6. ἔτι . . . στιγμαί; Each of the 'elements' (Earth, Air, Fire, Water) has its own proper place in the Cosmos and its own natural movement towards its proper place: and all 'places' are filled by elementary or composite bodies (cf. Introd. § 10). Since points are not bodies, they cannot have any 'place' and they cannot have any natural movement. Yet, if they are not 'in any place', i.e. if they are nowhere, how can they be the

constituents of a body? And if they have no movement, how can they coalesce to form a *συνεχές*?

16^{b} 6–8. ἁφή τε . . . στιγμήν. 'Contact' means, strictly speaking, the 'coincidence' (i. e. 'togetherness in the same immediately-continent place') of the 'extremes' or 'limits' of two *μεγέθη* (* 16^{b} 4). Hence it implies two *ἁπτόμενα* whose 'limits' are 'together'. But points are themselves 'limits', and nothing but 'limits': hence point cannot (strictly speaking) be *in contact with* point. Two lines can be *in contact*, i. e. their 'limits' (from which they, as 'the limited', are distinguished) can be 'together'. But a point cannot be distinguished into a 'limit' and a 'limited'. If, therefore, we speak of a *contact* of points, we are using the term in a different (and a looser) sense: it is a 'contact', into which the whole of both *ἁπτόμενα* is absorbed (*ὅλον ὅλου ἅπτεσθαι*). And it is clear that from *such* 'contacts' no *συνεχές* could result (cf. *Phys.* 231^{a} 26–29, ^{b} 2–6: *de Lin. Insec.* 971^{a} 26 ff., with my notes).

16^{b} 7–8. παρὰ . . . στιγμήν. On the supposition that a magnitude is 'points or contacts thus qualified', *ἁφή*, *διαίρεσις*, and *στιγμή* are equivalent terms: see *de Lin. Insec.* 972^{a} 28–30, with my note.

16^{b} 9–14. ἔτι . . . ταῦτα; Prantl brackets this passage as spurious. But, although it is difficult to see exactly how it connects with what has gone before, it is undoubtedly genuine; and it contains a new and important objection (^{b} 13–14) to the view that a *μέγεθος* is 'points or contacts thus qualified'.

If I divide a piece of wood into two, and then put the parts together again, the result is a single piece of wood of the same magnitude as before. The same principle applies, at whatever point I divide the wood. Let us suppose, then, that I have divided it at all points at once (i. e. through and through) and *put it together again*. It is now a magnitude, and *one*: and yet, since it has been through and through divided, it is still *potentially* through and through divided (^{b} 11–12 *πάντῃ ἄρα διῄρηται δυνάμει*). What distinguishes its present *potential* 'through and through dividedness' from the preceding *actual* 'through and through dividedness' when it had vanished into points? If we say 'the distinction depends on the presence or absence of a *πάθος*', we must explain how the wood can be dissolved into quality + points (*εἰς ταῦτα*, ^{b} 13) and how it can come-to-be out of quality + points:—in other words, we must explain how *πάθος* and that which it qualifies (viz. points) can be separated from one another so as to exist apart.

16b 12. τί . . . διαίρεσιν; 'What, then, is there in the wood besides the division (i. e. besides the points : cf. * 16b 7–8)?'

16b 17–18. ἔσκεπται . . . ἑτέροις. αὐτῶν, i. e. the ἀδύνατα resulting from the postulate of Indivisibles.

ἐν ἑτέροις, cf. *Phys.* 231a 21 ff., *de Caelo* 303a 3 ff. (cf. also *de Lin. Insec.* 969b 29 ff.).

16b 18–19. ἀλλὰ . . . λεκτέον. 'But we must try to disentangle these perplexities, and must therefore formulate the whole problem over again.'

ταῦτα, i. e. *both* sets of difficulties which together constitute the ἀπορία : cf. * 16a 14—17a 17. The argument which seems to force us to accept Indivisibles is restated (b 19–34) : the fallacy underlying it is exposed, and the true theory set forth, thus solving the ἀπορία (17a 1–17).

16b 19–25. τὸ . . . σημεῖον. 'On the one hand, then, it is in no way paradoxical that every perceptible body should be indivisible as well as divisible at any and every point. For the second predicate will attach to it *potentially*, but the first *actually*. On the other hand, it would seem to be impossible for a body to be, even potentially, divisible at all points simultaneously. For if it were possible, then it might actually occur, with the result, not that the body would simultaneously be actually *both* (indivisible and divided), but that it would be simultaneously divided at any and every point.'

διαιρετόν (which Bekker, following EL, inserts after δυνάμει in b 21) is probably due to accidental reduplication of διαιρετόν in b 22 : or it may have been a marginal note intended to explain τὸ μὲν γὰρ . . . ὑπάρξει (b 21).

δυνάμει (b 22) may have arisen by accidental reduplication of δυνάμει in b 21. If we retain it, it must be taken closely with εἶναι. It is not required with διαιρετόν, since that means δυνατὸν διαιρεθῆναι. Aristotle may have been induced to qualify εἶναι with δυνάμει, owing to the antithesis between ὑπάρξει δυνάμει and ὑπάρξει ἐντελεχείᾳ in b 21.

I suspect that the sentence οὐχ ὥστε . . . σημεῖον (b 23–25) was originally a marginal note, intended (like διαιρετόν in b 21) to explain τὸ μὲν γὰρ . . . ὑπάρξει. This suspicion is confirmed by the fact that F1 reads διῃρημένον δυνάμει καθ' in b 24–25. When the marginal note got displaced and inserted in the text, δυνάμει became unintelligible. Accordingly it was dropped, F1 alone retaining it.

16^{b} 28–34. ἀλλὰ . . . συγκρίσει. This reproduces the experiential basis of the Atomists' theory. A body cannot be divisible through and through: for that would mean that it consists of points or nothings. On the other hand, we see that a body 'is in fact divided into separable magnitudes which are smaller at each division—into magnitudes which fall apart from one another and are actually separated' (cf. *Phys.* 231^{b} 4–6). We have only to suppose this process of 'breaking-up' carried a little further, and we shall reach bodies too small to be visible (*ἀόρατα*, ^{b} 33: cf. 25^{a} 30). These invisible, minute bodies (separated from one another by 'the void', and indivisible because not comprising any 'void' within themselves) are the Atoms of Leukippos and Demokritos.

ἀλλὰ μέχρι του (^{b} 32), sc. *εἴη ἂν ἡ θρύψις*.

16^{b} 33–34. ἄλλως . . . συγκρίσει. Assuming that *γένεσις* and *φθορά* occur, and assuming that *γένεσις* is due to *σύγκρισις* and *φθορά* to *διάκρισις*, we seem to be forced to admit that the ultimate constituents of the perceptible bodies are 'invisible atoms'. For (a) an 'association' of points or nothings cannot produce a body, nor can a body be 'dissociated' into them; i.e. 'association' and 'dissociation' imply a limit to the body's divisibility: and (b) unless the 'associated' and 'dissociated' atoms were *invisible*, there would not be even an *apparent* emergence of what was not already there, or an *apparent* vanishing of what was there. But nobody would speak of *γένεσις* and *φθορά* unless there were, at least *in appearance*, a 'creation' and an 'annihilation'.

17^{a} 1–2. παραλογιζόμενος. The Atomists argue, according to Aristotle, that there must be atoms; because, if not, a body is divisible through and through, and this leads to an absurdity. For,

'What is *πάντῃ διαιρετόν* can be resolved into points or nothings:

'A body (*ex hyp.*) is *πάντῃ διαιρετόν*:

'Therefore a body can be resolved into points or nothings'.

But this syllogism is a *παραλογισμός* (faulty in form), for its middle term (*πάντῃ διαιρετόν*) is ambiguous. The major premiss is true, only if *πάντῃ διαιρετόν* means 'divisible everywhere simultaneously'. But the minor premiss is true, only if *πάντῃ διαιρετόν* means 'divisible everywhere successively, i.e. anywhere you please'.

17^{a} 2–17. ἐπεὶ . . . ἐλαττόνων. A can only be *immediately-next* (*ἐχόμενον*) to B, if A is (i) *consecutive to* (*ἐφεξῆς*) and (ii) *in contact with* (*ἁπτόμενον*) B (cf. *16^{b} 4).

Now point cannot be *consecutive to* point; for, between any two points, something συγγενές (viz. a line) always intervenes (cf. e. g. *Phys.* 231b 6–10). Nor can point be *in contact with* point, except in the loose sense of 'contact whole with whole' (cf. * 16b 6–8). Hence point is not *immediately-next* to point in a magnitude.

From this it follows that, though any given magnitude can be divided 'everywhere' in one sense (viz. *anywhere, at any point*), it cannot be divided 'everywhere' in another sense (viz. *at all points simultaneously*). For though there is a point 'everywhere' in the magnitude, in the sense that a point can be taken 'anywhere' within it, these points (i. e. 'all' the points of the magnitude) are not *immediately-next* to one another: i. e. they are not 'everywhere' in the sense that *at all places of the magnitude simultaneously* there are points. If, e. g., the given magnitude has been divided at its centre, it cannot also be divided at a point *immediately-next* to its centre: for there is no such point. On the other hand, the magnitude might have been divided at a point *immediately-next* to its centre, *instead of* at its centre: for a point might have been taken *there*, instead of at the centre.

Hence every magnitude is πάντῃ διαιρετόν, and yet no magnitude can be πάντῃ ἅμα διῃρημένον. And it is possible to take a point 'everywhere'—i. e. at any place, or *successively* at all places—in a magnitude: but not to take points 'everywhere' in a magnitude, i. e. *simultaneously* at all places within it.

τοῦτο (17a 4), sc. τὸ πάντῃ εἶναι διαιρετόν.

καὶ ὁπῃοῦν . . . εἶναι (a 5), 'that there is a point not only anywhere, but also everywhere, in the magnitude'.

17a 7–9. τὸ δ' . . . πάντῃ. 'But it is only *in one sense* that the magnitude is divisible through and through, viz. in so far as there is one point *anywhere* within it and all its points are *everywhere* within it if you take them singly one by one. But there are not more points than one *anywhere* within it, for the points are not *consecutive*: hence it is not simultaneously divisible through and through.'

τὸ δ' (a 7), sc. τὸ διαιρετὸν εἶναι.

ὥστ' οὐ πάντῃ (a 9), sc. διαιρετὸν ἔσται τὸ μέγεθος.

Grammatically it would be possible to interpret τὸ δ' (a 7) as τὸ δὲ στιγμὴν εἶναι, and ὥστ' οὐ πάντῃ (a 9) as ὥστ' οὐ πάντῃ στιγμὴ ἔσται: but this would not enable us to connect the passage with the next sentence (εἰ γὰρ κατὰ μέσον κτλ.).

17ª 10–12. εἰ . . . σύνθεσις. 'For if it were divisible through and through, then, if it be divisible at its centre, it will be divisible also at a point *immediately-next* to its centre. But it is not so divisible: for position is not *immediately-next* to position, nor point to point—in other words, division is not *immediately-next* to division, nor composition to composition.'

In ª 11, EFHLΦ^{c} read διαιρετόν· οὐ γάρ κτλ. Philoponos remarks that Aristotle *meant* to say τοῦτο δ' ἀδύνατον, and Γ reads 'non autem possibile'. J alone reads διαιρετόν· οὐχὶ δέ· οὐ γάρ κτλ. Mr. T. W. Allen pointed out to me that οὐχὶ δέ (sc. οὐκ ἴ δέ) might represent οὐκ ἔστι δέ (sc. κατ' ἐχομένην στιγμὴν διαιρετόν): and I have adopted this conjecture, though ἀλλ' ἀδύνατον (cf. Γ and Φ^{c}) would be more in accordance with Aristotle's usage.

17ª 11–12. σημεῖον . . . στιγμῆς. If any difference of meaning between σημεῖον and στιγμή is here intended, σημεῖον is probably employed as the wider term, to include an 'instant' (τὸ νῦν) as well as a spatial point. Aristotle uses σημεῖον of a 'point' of time (e. g. *Phys.* 262ᵇ 2, 25; *de Caelo* 283ª 11, 13), and the doctrine that point is not *consecutive to* point is expressly applied to τὸ νῦν as well as to στιγμή, e. g. *Phys.* 231ᵇ 6–10.

17ª 12. τοῦτο . . . σύνθεσις. For the interpretation given above, cf. * 16ᵇ 7–8. Possibly, however, these words have got displaced, and should be read after διάκρισις in ª 13.

17ª 16. εἰς μικρὰ καὶ ἐλάττω, 'into small (i. e. relatively-small) parts.' 'Dissociation' need not result in small constituents, but it must result in constituents which are relatively-small, i. e. smaller than that which is 'dissociated'.

17ª 17–31. ἀλλ' οὐχ . . . φασιν. Aristotle here lays down the meaning which he is going to attach to γένεσις, φθορά, and ἀλλοίωσις —i. e. their *nominal definitions*: cf. Introd. § 8 and * 14ª 6—17ª 31.

17ª 18–19. τὴν . . . ἀλλοίωσιν: the accusative depends upon φασιν.

17ª 22–23. οἱ δὲ . . . διαφέρει. οἱ δέ, the philosophers whom we are criticizing, i. e. primarily the Atomists.

τοιαύτην, sc. τὴν ἐν τῷ συνεχεῖ μεταβόλην, 'the change which takes place in what is continuous'; in contrast to the change by which a thing is 'dissociated' into discrete parts or a discrete plurality 'associated' to form a thing.

τὸ δὲ διαφέρει, 'whereas in fact there is a difference'. For there are two kinds of change, both of which may be called 'change in what is continuous'. Of these, (i) change in the constitutive

factors of the thing (a change of its 'substance') is γένεσις or φθορά: whilst (ii) a change in the thing's properties, where the substance of the thing is unaffected, is ἀλλοίωσις.

317ª 23–27. ἐν γὰρ . . . ἀλλοίωσις. 'For in that which underlies the change there is a factor corresponding to the definition, a formal factor, and there is a material factor. When, then, the change is in these constitutive factors, there will be coming-to-be or passing-away: but when it is in the thing's qualities, i.e. a change of the thing *per accidens*, there will be Alteration.'

The phrase τὸ μέν . . . ὕλην (ª 24) is hardly more than a periphrasis for τὸ μὲν λόγος (or εἶδος), τὸ δὲ ὕλη (cf. e.g. *Metaph.* 1033ᵇ 13, 1035ª 1). The εἶδος of a thing is strictly correlative to its λόγος, for a thing's 'form' is that of which the definition or *formula* (λόγος) states the constitutive moments (cf. Introd. § 7). The ὑποκείμενον—that which underlies the change—is a formed-matter or embodied-form, i.e. a σύνθετος οὐσία (cf. Introd. § 5). A change 'in' the form and matter—a change of the σύνθετος οὐσία as a whole—is γένεσις or φθορά. But a change 'in' the thing's properties, which leaves it, *qua this* composite of form and matter, unchanged, is ἀλλοίωσις: and this change is predicable of *the thing* only κατὰ συμβεβηκός (ª 26), not καθ' αὑτό. For, strictly-speaking, it is not *the thing*, *qua* thing, which changes: the thing changes only in respect to some one of the properties which 'go along with' it, which may or may not attach to it.

The full significance of Aristotle's present account of the distinction between γένεσις and ἀλλοίωσις will emerge gradually in the course of Chapters 3 and 4.

317ª 27–28. διακρινόμενα . . . γίνεται. As the illustration shows, this is a brachylogy for εὔφθαρτα καὶ ἄφθαρτα (δύσφθαρτα) γίνεται. 'Association' and 'dissociation' are not γένεσις and φθορά, but 'dissociation' may facilitate or hasten, and 'association' may retard, γένεσις and φθορά.

317ª 28–29. ἐὰν . . . βραδύτερον. As we shall learn presently (cf. * 18ª 23–25), the γένεσις of one thing is always *eo ipso* the φθορά of another. Here, therefore, θᾶττον ἀὴρ γίνεται necessarily implies that θᾶττον ὕδωρ φθείρεται.

ἐὰν δὲ συγκριθῇ, i.e. if small drops of water have first been 'associated' together (so as to form a big sheet of water).

317ª 30. ἐν τοῖς ὕστερον. Cf. 28ª 23 – ᵇ 22, where it becomes clearer how 'association' and 'dissociation' affect a thing's susceptibility to φθορά.

17ª 31. οἷαν . . . φασιν, i. e. (as Philoponos rightly explains) γένεσις cannot be identified with σύγκρισις ἐξ ἀτόμων.

A. 3

17ª 32—19ᵇ 5. Διωρισμένων . . . εἰρήσθω. Having defined the meaning of the terms γένεσις and φθορά (having given their 'nominal definitions'), Aristotle proceeds to prove ὅτι ἔστι, i. e. that corresponding processes do in fact occur in Nature (cf. * 14ª 6—17ª 31). According to their 'nominal definitions', γένεσις and φθορά must be distinguished from ἀλλοίωσις, σύγκρισις, and διάκρισις. The terms mean processes in which a composite of form and matter changes *as a whole*, so that a new composite (a new 'substance') emerges, or so that a given composite vanishes (cf. * 17ª 23–27).

The terms are commonly applied, in the sense defined, to many processes in Nature:—e. g. to the reciprocal 'transformations' of Earth, Air, Fire, and Water, and to the coming-to-be of plants (cf. 19ª 11). Aristotle shows (a) that such an interpretation of these and similar processes is *possible*, since it does not necessarily conflict with the admitted postulates that 'Nothing can come-to-be out of Nothing' and that 'No property can exist *per se*, apart from a substance'; and (b) that such an interpretation follows logically from his own theory of the physical Cosmos. For the conceptions of πρώτη ὕλη and of 'the efficient cause of motion', which are established in the *Physics*, are adequate to account for the actual occurrence of γένεσις and φθορά (in the sense defined), and indeed for their occurrence with unbroken continuity in Nature.

17ª 32. πρῶτον. The second main topic of investigation is formulated at 17ᵇ 34–35.

17ª 32–34. ἔστι τι . . . καὶ τί. Since γένεσις is a πάθος, its 'being' is its 'inhering in' a substance (cf. Introd. p. xxvi$_1$). Strictly, therefore, the question εἰ ἔστι γένεσις should be formulated as Aristotle here formulates it:—'Is there anything which comes-to-be in the unqualified sense? Is there anything of which ἁπλῆ γένεσις can be predicated?'

The 'proper' sense (κυρίως, ª 33) is the 'unqualified' sense (ἁπλῶς). If there is substantial change, i. e. if a new 'substance' emerges or an existing 'substance' vanishes, we say, without qualification, γίγνεται or φθείρεται. If, on the other hand, a thing remains substantially unaltered, but changes its quality, its size,

or its position, we add a qualification to the verb. We say 'it comes-to-be-*ill*', 'comes-to-be-*white*', 'comes-to-be-*big*', &c. This is τὶς γένεσις or τὶς φθορά. Since, when that is so, we also qualify *the thing* (e. g. 'the *black* thing comes-to-be white', 'the *small* thing comes-to-be big'), the processes are sometimes called γένεσίς τινος or φθορά τινος. Or, as Aristotle expresses it, in the qualified processes 'a thing always comes-to-be-something out of being-something' (ἀεὶ δ' ἔκ τινος καὶ τί, ª 34).

Thus the antithesis between γένεσις (or φθορά) ἁπλῆ and τὶς is between substantial change and change of πάθος, i. e. change in Categories other than that of Substance. We shall see presently that Aristotle also uses the antithesis in a different sense: for (i) amongst substantial changes, some are regarded as ἁπλαῖ in contrast to others, and (ii) amongst changes of πάθη, some are regarded as *relatively* ἁπλαῖ. Cf. * 18ª 27—19ª 22, 19ª 14–17.

Zabarella rightly compares *Post. Anal.* 89ᵇ 36—90ª 5. For just as γίγνεσθαι ἁπλῶς means 'to come-to-be', whilst γίγνεσθαι with a qualification means 'to come-to-be-so-and-so'; similarly εἶναι ἁπλῶς means 'to be' ('to exist'), whilst εἶναι with a qualification functions as the copula and means 'to be-so-and-so'. Hence Aristotle (l. c.) distinguishes the question εἰ ἔστιν ἁπλῶς (e. g. 'Does the moon exist? *Is* there a moon?') from the question εἰ ἔστι τι (e. g. 'Is the moon eclipsed?'). The former (existential) question is an inquiry into the being of the thing as a ὑποκείμενον—a 'substance', or whole of form and matter: the latter (which Aristotle also calls the question εἰ ἔστιν ἐπὶ μέρους, or an inquiry into τὸ ὅτι) is an inquiry into a part of the thing's being, its being in a certain respect, i. e. its possession of a property.

17ᵇ 1–13. εἰ . . . γινόμενον. An argument to show that *unqualified* γένεσις is impossible, because it would involve *either* that something can come-to-be out of sheer nothing, *or* that πάθη can exist apart from substances: and both of these alternatives are admittedly absurd.

The argument runs thus:—If a thing is to 'come-to-be-healthy', it must start from a state in which it is ill, i. e. 'is-not-healthy'. Similarly, if it is to 'come-to-be', it must start from 'not-being'. As *qualified* γένεσις presupposes *qualified* not-being, so *unqualified* γένεσις presupposes *unqualified* not-being. Now 'unqualified not-being' means *either* (i) the absence of all 'being' belonging to the Category in question, *or* (ii) the absence of all 'being' in any

and every sense of the term. Whichever interpretation we adopt, 'unqualified *γένεσις*' (we shall be forced to admit) presupposes a 'not-being' which is sheer nothing. This follows at once if we adopt the *second* interpretation. But it follows no less if we adopt the *first*. For the Category here in question is the Category of Substance. Hence 'unqualified *γένεσις*' presupposes 'what is not in any sense a substance'. But what is not a substance cannot be qualified or quantified or in any way determined: for all *πάθη* are *πάθη* of a substance, and their 'being' is to characterize a substance. Hence 'what is not in any sense a substance' is not in any sense at all: i.e. is sheer nothing.

17^b 2. ἁπλῶς ἄν . . . ὄντος. *ἁπλῶς* grammatically qualifies the whole clause: but the point is that such *γένεσις* presupposes a *μὴ ὄν* which is *ἁπλῶς μὴ ὄν*.

τι is of course the subject of the clause.

17^b 3. ὅτι ὑπάρχει τισὶ τὸ μὴ ὄν. Probably this is intended as a reminiscence of Plato, *Sophist.* 237 ff. It is self-contradictory to say that unqualified not-being 'belongs to' (is a predicate of) certain subjects: for a subject, if it is to be conceived or mentioned at all, must 'be' in some sense. *τὶ* means *ὄν τι*.

17^b 5–7. τὸ . . . περιέχον. The two senses of *τὸ ἁπλῶς μὴ ὄν* correspond to two senses of *τὸ ἁπλῶς ὄν*. For *τὸ ἁπλῶς ὄν* may mean either (i) that which 'is' in the most general and indeterminate sense—a sense which includes any and all of the Categories, without specifying *which*: or (ii) that which 'is' in the sense of one of the Categories—a sense which is determined e.g. as 'substantial' or as 'quantitative' being, without further specification of the *type* of substantial or quantitative being affirmed. Thus you would affirm *ὅτι ἔστιν ἁπλῶς* of a man in sense (i) if you said simply 'he is'; and in sense (ii) if you said 'he is a substance'. Similarly, if e.g. 'white' came-to-be out of what was not a *quality* at all, or 'man' out of what was in no sense a *substance*, there would be *γένεσις* out of *τὸ ἁπλῶς μὴ ὄν* in the sense specified by Aristotle *first* (17^b 6): whilst, if 'white' or 'man' came-to-be out of what could not be said to 'be' *in any sense whatever*, there would be *γένεσις* out of *τὸ ἁπλῶς μὴ ὄν* in the *second* sense specified by Aristotle (17^b 7).

17^b 6. τὸ πρῶτον . . . ὄντος. On Aristotle's theory of the Categories, see Apelt, Essay III.

'That which is *first* in each several mode of predicating "being"' is (as Philoponos rightly explains) *τὸ γενικώτατον*, or

τὸ ἀνωτάτω γένος. The 'mode of predicating' in question (i. e. the Category) is named after this 'first (most general) predication of "being"' within it, and is indeed generally identified with it. Thus, in the first Category, *τὸ πρῶτον* would be *οὐσία* in general, in the second *ποιόν* in general, in the third *ποσόν* in general, and so forth. The first Category *is οὐσία*: for, 'in this mode of predicating "being"', the *ὄν* which is predicated is always *substantial being*—viz. either *οὐσία* in general or some specified type of *οὐσία*.

317^{b} 7–13. **εἰ . . . γινόμενον.** 'If then *unqualified not-being* means the negation of "being" in the sense of the primary term of the Category in question, we shall have, in *unqualified coming-to-be*, a coming-to-be of a substance out of not-substance. . . . If, on the other hand, *unqualified not-being* means "what is not in any sense at all", it will be a universal negation of all forms of being . . .'

The two alternatives correspond to the alternative senses of *ἁπλῶς* (cf. ^{b} 5–7), and both lead to the conclusion that *ἁπλῆ γένεσις* involves that 'something can come-to-be out of sheer nothing': this absurd consequence follows at once on the second alternative, and could only be avoided on the first alternative by the (equally absurd) supposition that 'properties can exist apart from substances' (cf. * 17^{b} 1–13).

With *εἰ μὲν οὖν τὸ πρῶτον* (sc. *μὴ ὄν*) in ^{b} 7, and with *εἰ δὲ τὸ μὴ ὂν ὅλως* in ^{b} 11, we must, I think, supply *σημαίνει τὸ ἁπλῶς μὴ ὄν*. In ^{b} 11, Bekker and Prantl place a comma after *δέ*, which makes nonsense of the passage.

In the *first* sense of *τὸ ἁπλῶς μὴ ὄν*, 'white' e. g. would come-to-be out of *τὸ ἁπλῶς μὴ ὄν* if it came-to-be out of *μὴ ποιόν*, *τρίπηχυ* if it came-to-be out of *μὴ ποσόν*, and so forth. Since, however, *ἁπλῆ γένεσις* is the coming-to-be of a *substance*, the Category of Substance is *here* in question: and the *ἁπλῶς μὴ ὄν* presupposed by *ἁπλῆ γένεσις* is *μὴ οὐσία* (^{b} 8).

317^{b} 10. **τὸ ποῦ.** This is the reading of EF^{1}HL. J has *τόπος* (cf. Γ), and F writes *τόποι* above the line. Grammatically of course *ποιόν*, *ποσόν* and *ποῦ* are the subjects to *ὑπάρχει*.

317^{b} 11. **ὅλως,** i. q. *καθόλου* (^{b} 7).

317^{b} 13. **ἐν ἄλλοις.** *Phys.* A. 6–9.

317^{b} 14. **διώρισται τοῖς λόγοις.** *λόγοι* probably means 'definitions'. Aristotle is referring to his definitions of the various senses in which a thing comes-to-be out of *τὸ μὴ ὄν* and out of *τὸ ὄν*: and again to his definitions of the parts which *στέρησις* and *ὕλη* respectively

play as the presuppositions of γένεσις (cf. *Phys.*, e. g. 191^{b} 9–10, ^{b} 13–16, 192^{a} 31–32, &c.).

17^{b} 14–18. συντόμως . . . ἀμφοτέρως. This 'concise restatement' of the doctrine of the *Physics* leaves it as yet uncertain what exactly the presupposed basis of substantial γένεσις is, and indeed whether there can be γένεσις of a substance at all—as Aristotle himself points out immediately (17^{b} 18 ff.).

All that we have learnt so far is:—γένεσις presupposes something which can be truly called both ὄν and μὴ ὄν (^{b} 17–18 λεγόμενον ἀμφοτέρως: so Zabarella and Pacius interpret these words, undoubtedly correctly). For γένεσις presupposes that which is-potentially but is-not-actually. Hence, in one sense, things come-to-be out of μὴ ὂν ἁπλῶς: and yet, in another sense, they always come-to-be out of ὄν.

This description of the presupposed basis of γένεσις (as 'that which is-potentially but is-not-actually') would apply *either* to the proximate ὕλη of τὸ γιγνόμενον (i. e. a formed-matter, a concrete substance) *or* to πρώτη ὕλη, the ὑποκείμενον conceived in abstraction from all the forms which it acquires in its transformations. Both interpretations are so far possible: and both interpretations are required in supplementation of one another, if the description is to be an adequate summary of the doctrine in the *Physics*.

Consider, e. g., the γένεσις of Air. This presupposes as its basis a proximate ὕλη which is itself a concrete substance, viz. Water. 'Air comes-to-be out of Water' (i) in so far as the *substratum*, which *is-actually* Water, *is-potentially* Air: i. e. in so far as the conditions for the development of Air are present in *this* actual formation of the *substratum*: and (ii) in so far as the *substratum*, which is Water, *is-not-actually* Air. For, though capable of receiving the form of Air, it is actually 'without' it, or 'deprived of' it. Thus (i) Air comes-to-be 'out of' something which *is-potentially* Air, and which may therefore be called ὄν. And yet (ii) Air also comes-to-be 'out of' the στέρησις of Air; or rather (since a στέρησις is καθ' αὐτὸ μὴ ὄν, cf. *Phys.* 191^{b} 13–16) 'out of' something which (in so far as it *is-not-actually* Air) may be called μὴ ὄν. The proximate ὕλη, in short, is the basis presupposed by γένεσις *both* (i) in respect to its positive 'potential-being' (which becomes actual as the result of the γένεσις), *and* (ii) in respect to its 'actual not-being', i. e. in respect to its 'want' of a form which it is capable of acquiring—a 'want' which is removed as the result of the γένεσις.

At the same time, the γένεσις of Air (if we carry our analysis further back) presupposes as its basis πρώτη ὕλη. For, in the γένεσις of Air, the *substratum*, which was informed as Water, casts off that form and takes on a new one—i. e. is 'transformed'. The *substratum*, indeed, never *exists* except *qua* determined by some form. But we can *in thought* abstract it from all its forms, and conceive it as matter undetermined, though determinable. Aristotle's description would apply to this logical abstraction—πρώτη ὕλη—as well as to the proximate matter. For πρώτη ὕλη is 'that which *is-not-actually* (Water or Air or any concrete substance), but *is-potentially* (Water and Air and every concrete substance)'. Cf. * 18^{a} 23–25.

17^{b} 15. ἐκ μὴ ὄντος ἁπλῶς. The basis of γένεσις only *is* with a qualification, i. e. it *is*-δυνάμει. τὸ ἁπλῶς μὴ ὄν means 'that which is, without qualification, devoid of being': but τὸ μὴ ὂν ἁπλῶς means 'that which is devoid of being, unless you qualify the term "being"' (cf. * 19^{a} 29 – ^{b} 4).

17^{b} 18–19. ὃ . . . ἐπαναποδιστέον. The problem, which Aristotle is about to discuss, emerges (on re-examination of the question as to the presuppositions of ἁπλῆ γένεσις) precisely because of the vagueness of the 'concise restatement' in ^{b} 14–18.

How are we to interpret 'that which *is-potentially*, but *is-not-actually*'? (i) If as the *proximate* ὕλη, then it looks as if γένεσις is after all not the coming-to-be of a substance: for the *proximate* ὕλη is itself already formed-matter, i. e. a substance. (ii) If, on the other hand, as πρώτη ὕλη, we are confronted with serious difficulties.

ἐπαναποδιστέον apparently occurs only here. But ἀναποδίζειν means 'to recall for further examination': cf. Herodot. v. 92, § 6, with Stein's note.

17^{b} 19–20. πῶς . . . ἄλλως: this whole clause is the appositional antecedent of ὅ (^{b} 18).

17^{b} 23. εἰ . . . γίνεται, 'for if a substantial thing comes-to-be . . .' The manuscripts and Bekker read εἰ γάρ τι γίνεται: but the meaning is determined by l. 21 (ἆρ' . . τοῦδε), and I suspect that Aristotle wrote εἰ γὰρ τόδε τι γίνεται.

17^{b} 27–28. τὸ . . . ὄν; καὶ ὄν is explanatory of τόδε, and μηδ' ὄν is explanatory of μὴ τόδε. The basis of γένεσις, *qua* only potentially 'this' (or 'substance'), only potentially 'is': and, *qua* not actually 'this', it has no actual 'being'. All further determinations of 'being'—quality, quantity, position, &c.—are dependent upon *substantial* 'being'.

17^{b} 29. τὸ μὴ οὕτως ὄν. The reading of FHJ (cf. Γ), τὸ οὕτω (or οὕτως) μὴ ὄν, is an attempt at correction. Bonitz (*Ind.* 539^{a} 36–37) treats τὸ μὴ οὕτως ὄν as a mere idiomatic transposition of the negative, and as equivalent to τὸ οὕτως μὴ ὄν. But the words mean, I think, 'a *being* which is no *determined-being*' (cf. also Bäumker, p. 234_{5}).

Aristotle is repeating in different words what he had already said above (^{b} 23–25). The completely indeterminate, though determinable, basis of substantial γένεσις, which is really only isolable by definition, threatens to become a *really-existent* antecedent of γένεσις. According to his own theory, the ultimate logical presupposition of γένεσις is a *substratum* conceived in abstraction from all forms, i. e. πρώτη ὕλη. But πρώτη ὕλη does not *exist*. It is not a real antecedent of any γένεσις, in the way in which the proximate ὕλη (e. g. Water) is the real antecedent of a given γένεσις (e. g. of Air): cf. * 18^{a} 23–25, * 29^{a} 24 – ^{b} 3.

17^{b} 31–32. εἰ . . . ὑπάρξει, 'but if it is not a this-somewhat or a substance . . .' In Aristotle's usage τόδε (cf. e. g. 17^{b} 9, 21, 27; *Metaph.* 1038^{b} 24) means 'a this', i. e. 'this or that or any designable': τόδε τι (cf. e. g. 18^{b} 1, 15, 32; 19^{a} 12; *Metaph.* 1038^{b} 25) means 'a designable somewhat'—i. e. any *that* with a *what*, provided the *what* belongs to the first Category. (For the substance of this note I am indebted to my friend, Professor J. A. Smith, who has convinced me that Burnet is mistaken in what he says about τόδε τι in his *Ethics*, p. 66_{7}: cf. *Classical Review*, vol. 35, p. 19).

17^{b} 33. καθάπερ εἴπομεν: 17^{b} 10–11.

17^{b} 34–35. καὶ . . . μέρος. The solution of this *second* main problem (cf. * 17^{a} 32) carries with it the solution of the *first*: cf. * 18^{a} 10–13. The meaning of ἀεί is explained more fully below, cf. * 37^{b} 29—38^{a} 3. The 'fact', for which Aristotle is to seek the cause, is an unbroken succession of γενέσεις and φθοραί, and generally of all forms of change, in the sublunary sphere. Under γένεσις Aristotle here includes (i) *substantial* coming-to-be and passing-away (ἁπλῆ γένεσις and ἁπλῆ φθορά), and (ii) the three forms of process in which a perceptible substance changes its quality, quantity, or place (ἀλλοίωσις, αὔξησις καὶ φθίσις, φορά). These last three forms of process are here called γένεσις ἢ κατὰ μέρος, because in them the thing comes-to-be not as a whole (or as regards its 'substance'), but in respect to a part of its 'being' (or as regards its συμβεβηκότα): cf. * 17^{a} 32–34, and 17^{b} 3–5. Aristotle's usual practice is to draw a sharp distinction between the

three εἴδη κινήσεως (ἀλλοίωσις, αὔξησις καὶ φθίσις, φορά) and γένεσις and φθορά, and to use the term μεταβολή to cover *all* forms of change (i. e. γένεσις and φθορά as well as the three species of κίνησις): cf. * 19b 6—20a 7. But this practice is by no means invariable.

The distinction between ἁπλῆ γένεσις and γένεσις ἡ κατὰ μέρος (b 35) has nothing to do with the distinction *within substantial changes* between ἁπλῆ γένεσις and τὶς γένεσις (cf. * 17a 32–34) which is drawn for the first time at 18a 27 ff.

18a 1–2. οὔσης . . . ὕλης. αἰτίας, sc. τοῦ γένεσιν ἀεὶ εἶναι. The explanation of the perpetuity of γένεσις depends primarily on the material and efficient causes: but Aristotle's account of the efficient cause (B. 10) includes a consideration of the End towards which its activity is directed, i. e. of the final cause of γένεσις, viz. the eternal conservation of the species or 'form' of the γεννητά (cf. 36b 25—37a 1).

18a 3–4. εἴρηται . . . λόγοις. *Phys.* Θ. 3 ff., especially 258b 10 ff.

18a 4–5. τὸ μὲν . . . ἀεί. The *first* is the πρῶτον κινοῦν, i. e. God. The *second* is τὸ πρῶτον ὑπὸ τούτου κινούμενον (*Phys.* 259b 33), i. e. the πρῶτος οὐρανός, the outermost shell of the Cosmos—the sphere in which the fixed stars are set—which is eternally and uniformly revolving (cf. Introd. § 10). Philoponos calls it τὸ κυκλοφορητικὸν σῶμα: cf. also * 36a 14 – b 10, * 36a 14–18, * 37a 30–31.

18a 5–6. τούτων . . . ἔργον. 'The other, or prior, philosophy' is πρώτη φιλοσοφία or θεολογική: cf. Introd. §§ 3, 4.

The reading and interpretation of this passage are confirmed by *de Caelo* 298b 19–20. The variants in E1 and L are to be rejected as blunders.

18a 7. ὕστερον: B. 10.

18a 8. τί . . . ἐστιν, 'which amongst the so-called "specific" or "concrete" causes exhibits this character', i. e. τἆλλα κινεῖ διὰ τὸ συνεχῶς κινεῖσθαι. Perhaps we ought to read αἰτίων instead of αἴτιον. For τὰ καθ' ἕκαστα λεγόμενα αἴτια, as opposed to causes in the universal sense, cf. *Phys.* 195a 27 ff. on the τρόποι τῶν αἰτίων.

18a 9. τὴν . . . τιθεμένην. For this use of εἶδος, cf. Bonitz, *Ind.* 218b 13 ff., and *Metaph.* 984a 17 αἰτίαν . . . τὴν ἐν ὕλης εἴδει λεγομένην. Cause is not a γένος, of which the four types of cause are εἴδη (species), as Philoponos and Zabarella remind us.

18a 10–13. ἅμα . . . γενέσεως. When we have learnt the material cause, we shall understand *both* why γένεσις and φθορά never fail to occur in Nature, *and* what is that 'potential substance' which unqualified γένεσις and φθορά presuppose.

The καί after λέγειν (ª 12) is explanatory: 'it will simultaneously become clear what account we ought to give of that which perplexed us just now, i.e. of *unqualified* passing-away and coming-to-be'.

18ª 13. συνείρειν: cf. * 16ª 8.

18ª 20–21. τοῦτο . . . διαίρεσιν. Aristotle had shown in the *Physics* (Γ. 5 ff.) that there is no actual Infinite. 'Infinite' is always a predicate (e.g. of body, of number, of time). It expresses the possibility e.g. of dividing a given finite body, or of adding to a given finite number, *ad infinitum*. But this possibility can never be completely realized: there will never actually be an infinite plurality of parts or of units.

δυνάμει δ' ἐπὶ τὴν διαίρεσιν, sc. ἐστὶν ἄπειρον. Cf. *Physics*, l. c., 206ª 9 – ᵇ 33. Aristotle there recognizes a 'potential infinite' in two complementary senses, in both of which the same principle is involved; viz. an ἄπειρον κατὰ διαίρεσιν (or ἀφαιρέσει) and an ἄπειρον κατὰ πρόσθεσιν. You can go on dividing a given finite magnitude *ad infinitum*, since there are no indivisible magnitudes. And if, e.g., having divided a given magnitude by progressive bisections, you take the successive 'halves', you get an endlessly diminishing series of fractions ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ . . .) which will never exhaust the original magnitude. Nor, conversely, can you reconstruct the whole, if you start with one of these fractions and add to it the succeeding terms of the series. For $1 = \frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots$ *ad infinitum*; i.e. such a series could only be summed in an 'infinite' time, viz. never.

18ª 21–23. ὥστ' . . . ὁρῶμεν. Assuming that the material of γένεσις, although actually finite, is infinite δυνάμει ἐπὶ τὴν διαίρεσιν, the succession of γενέσεις might continue for ever, *provided that* what came-to-be dwindled progressively in the same ratio in which the material was diminishing. The race of mankind, e.g., would have to dwindle so that the sizes of the succeeding generations of men would correspond to an infinitely diminishing series of fractions. Unfortunately, however, this ingenious suggestion for solving the difficulty is negatived by the facts.

Translate: 'so that we should have to suppose that there is only one kind of coming-to-be in the world:—viz. one which never fails, because it is such that on each successive occasion what comes-to-be is always smaller than before'.

18ª 23–25. ἆρ' . . . μεταβολήν; This sentence contains Aristotle's solution of the difficulty as to how perpetual γένεσις is

possible, and also (implicitly) his answer to the former question, viz. in what sense ἁπλῆ γένεσις presupposes 'potential substance'.

The difficulty as to the perpetuity of γένεσις depended on the assumption that τὸ φθειρόμενον passes-away into τὸ μὴ ὄν, and that τὸ μὴ ὄν is nothing (cf. ª 14–15). But Aristotle maintains that what occurs is always a two-sided process, one concrete substance being converted into another (e. g. Water into Air) so that the passing-away of the one *is* the coming-to-be of the other, or *vice versa*. This two-sided process is, in ultimate analysis, the transformation of a permanent *substratum* (πρώτη ὕλη) whereby it drops one form and takes on another. Since the *substratum* never exists as *bare* matter, but always is formed, there always is a positive actual substance. Hence φθορά is not annihilation. There is no passing-away into nothing and therefore no gradual exhaustion of τὸ ὄν. Matter is eternal, but it exists always, and only, as formed-matter: and the succession of γενέσεις is perpetual, for matter is always being transformed, though never annihilated.

The two-sided process, which is the γένεσις of one concrete substance and the φθορά of another, is thus (in respect to πρώτη ὕλη) the substitution of one positive form for another positive form. But each of these positive 'poles' of the process has also a negative side: and, *strictly speaking*, it is the negative side which constitutes the *terminus a quo* of γένεσις and the *terminus ad quem* of φθορά. If e. g. Air comes-to-be out of Water, what is relevant in the antecedent is not the positive form which the *substratum* in fact possesses (not its being *Water*), but its στέρησις of Air—i. e. the fact that the *substratum* is 'without', and yet is by nature capable of acquiring, the form of Air. Air, in fact, comes-to-be-out-of *Water-qua-not-Air*: and this same change is φθορά, in so far as in it Water passes-away-into *Air-qua-not-Water*. The antecedent of the γένεσις must be *a* positive concrete substance, but need not be *this* one (viz. Water): and the φθορά must terminate in *some* positive concrete substance, but not necessarily in Air. Hence the γένεσις of Air is *per se* ἐκ τῆς στερήσεως and only *per accidens* 'out of' Water.

Thus the 'potential substance' presupposed by γένεσις is *some indeterminate one out of a number of alternative actual formations* of πρώτη ὕλη. Cf. also * 29ª 24 – ᵇ 3.

18ª 25–27. περὶ . . . αἰτίαν. 'The cause just suggested' (ταύτην) is the 'material cause' in the sense of πρώτη ὕλη: cf. the recapitulation (19ª 18–22) and the preceding note. We should

perhaps have expected τοῦ γένεσιν εἶναι ⟨συνεχῶς⟩ in ^{a} 26 (cf. 19^{a} 19). But Aristotle claims to have stated the material cause which is adequate (ἱκανήν, ^{a} 27) to account for the 'being' (as well as the perpetuity) of γένεσις and φθορά. And in fact, since substantial γένεσις and φθορά are not creation and annihilation, but transformation, given πρώτη ὕλη—a transformable ὑποκείμενον, which is able to accept every form and always exists under some form—these processes *can* take place and *can* perpetually continue: and they can do so under no other condition. Hence πρώτη ὕλη is the *conditio sine qua non* of their 'being' and their perpetuity: i. e. it is their adequate 'material cause'.

ὁμοίως (^{a} 26) must be taken closely with περὶ ἕκαστον τῶν ὄντων (cf. * 14^{a} 2, 35^{a} 26). Aristotle professes, in accordance with his original programme, to have stated the material cause of γένεσις and φθορά 'in their general character, as they occur in all existing things alike'. In the next sentence, τὰ μὲν . . . τὰ δ' (^{a} 28) are contrasted with ὁμοίως . . . ὄντων and πᾶσιν (^{a} 27). For the next problem arises precisely because linguistic usage distinguishes between the γένεσις of some things and that of others, although (as Aristotle has maintained) these processes exhibit the same general character uniformly in all things.

18^{a} 27—19^{a} 22. διὰ τί . . . γένεσις. If Aristotle's theory of substantial γένεσις is true, we ought never to speak of ἁπλῆ γένεσις or of ἁπλῆ φθορά, but always and uniformly of a two-sided process which is both the γένεσις of something and *eo ipso* also the φθορά of something else. But linguistic usage appears to conflict with the theory. For (i) *of changes within the Category of Substance* some are called γένεσις without qualification, or φθορά without qualification, whilst others are qualified. The birth of a man, e. g., is called γένεσις ἁπλῶς, and not φθορά at all: his death is called φθορὰ ἁπλῶς, and not γένεσις at all. Or, if we speak of φθορά when a man is born, we qualify it as 'the passing-away of the seed': and if we speak of γένεσις when a man dies, we qualify it as 'the coming-to-be of a corpse'. And (ii), using γένεσις and φθορά in the broad sense *which includes changes in the Categories other than Substance*, some things (e. g. 'the growing thing') are said γίνεσθαι ἁπλῶς, whilst others (e. g. 'the learning thing') are said to come-to-be only with a qualification (e. g. 'to come-to-be-learned').

In the present passage Aristotle endeavours to account for this apparent conflict of linguistic usage with his theory. He begins

by formulating both applications of the distinction of appellation—the *first* at 18ª 31–33, and the *second* at 18ª 33–35. Next (18ª 35—19ª 3) he suggests three different grounds on which the distinction of appellation is based *within substantial changes*: and of these three, the second alone is endorsed by him as sound. Then (19ª 3–11) he restates the *second* use of the distinction (viz. *its application to all changes*), and marks it off carefully from the *first* which he has already discussed (cf. 19ª 5–8 *νῦν μὲν . . . μεταβάλλουσιν*). He shows that this second application of the distinction is based upon the difference of the Categories, so that *substantial change* is called *unqualified*, and *change of accidents* is called *qualified*, *γένεσις* or *φθορά* (19ª 11–14). But he adds a note to explain that nevertheless, *in all the Categories*, some changes are called *γενέσεις* (only) and others *φθοραί* (only) by an analogous application of the same principle which justified the distinction between *unqualified* and *qualified* *γένεσις* and *φθορά* *within substantial changes alone* (19ª 14–17). Finally (19ª 17–22) he recapitulates the purport of the whole passage from 17ª 32.

18ª 29. *πάλιν*, 'once more': for it was from this same peculiarity of linguistic usage that Aristotle started (17ª 32 ff.) to establish the being of *ἁπλῆ γένεσις*.

18ª 31–33. *λέγομεν . . . φθορά.* *The first peculiarity of linguistic usage*: cf. * 18ª 27—19ª 22. When e.g. a man dies, we say simply *φθείρεται*, instead of *φθείρεται ⟨μὲν⟩ τοδί*, *⟨γίνεται δὲ τοδί⟩*: and we call the change *φθορά* simply, instead of *φθορὰ ⟨μὲν τουδί*, *γένεσις δὲ τουδί⟩*.

18ª 33–35. *τοδὶ . . . οὔ.* *The second peculiarity of linguistic usage*: cf. * 18ª 27—19ª 22, and 19ª 8–11. On Aristotle's theory, the coming-to-be of a plant is the passing-away of a seed: and the coming-to-be of a scholar is the passing-away of a dunce. But, in fact, we call *the first* change 'coming-to-be' simply, and *the second* 'coming-to-be-learned'.

18ª 35 – ᵇ 12. *καθάπερ . . . μὴ ὄν.* All three defences of the distinction of appellation (as applied to changes within the Category of Substance) are grounded on a difference—real or supposed—in the 'proximate matter' of the change:—viz. in the *ὕλη ἐξ ἧς καὶ εἰς ἣν μεταβάλλει* (cf. 18ᵇ 33—19ª 3), or in 'that into which the changing thing changes' (18ᵇ 2–3).

The first defence is grounded on the supposed fact, that the proximate matter' of all substantial changes is in the end a modification of one of two fundamental materials, viz. a material

which has 'positive being' (*τὸ ὄν*) and a material which has 'negative being' (*τὸ μὴ ὄν*). It is suggested, then, that a substantial change into *τὸ ὄν* is called *ἁπλῆ γένεσις* (or *φθορά τινος*), whilst a substantial change into *τὸ μὴ ὄν* is called *ἁπλῆ φθορά* (or *τὶς γένεσις*).

18ª 35 – ᵇ 1. καθάπερ . . . τὰ δ' οὔ. The distinction (as is clear from the context) is not between Substance and the remaining Categories, but between terms signifying 'positive reals' and terms with a 'negative' signification. As here employed, the distinction is Pythagorean (see next note). But (cf. * 18ᵇ 14–18) Aristotle himself adopts a modified form of it to justify the distinction of appellation: and perhaps this is why he says *πολλάκις διορίζομεν*. Apparently *καθάπερ* is answered by *διὰ τοῦτο*. The construction is irregular, to say the least, and I have not been able to find any parallel.

18ᵇ 6–7. ὥσπερ . . . γῆν. According to Burnet's punctuation, which I have adopted as on the whole most probable, Parmenides 'says that the things into which change takes place are two' (*λέγει δύο*, sc. *τὰ εἰς ἃ μεταβάλλει τὸ μεταβάλλον*): 'and he asserts that these two, viz. *what is* and *what is not*, are Fire and Earth'.

Aristotle ascribes this view to Parmenides in many other places also: cf. *Metaph.* 986ᵇ 27 ff., and see below, * 30ᵇ 13–19, * 35ᵇ 16–17, * 36ª 1–12. But it is put forward by Parmenides himself in the second part of his poem (i. e. in 'the Way of Opinion') as the prevalent, but erroneous, theory: cf. Parmenides, fr. 8, ll. 51 ff. (Diels, pp. 121–2). Burnet (§§ 90, 91) is almost certainly right (i) in maintaining that 'the Way of Opinion' is 'a sketch of contemporary Pythagorean cosmology', and (ii) in suggesting that Aristotle never intends to ascribe the theory to Parmenides himself, but merely to cite 'Parmenides', i. e. the poem of Parmenides, as a work in which the theory is expounded.

18ᵇ 8–9. τὸν . . . ὑποκείμενον: 'for we are trying to discover not *what undergoes* these changes, but *what is their characteristic manner*.'

18ᵇ 9–10. τὸ μὴ ὂν ἁπλῶς: cf. * 17ᵇ 15.

18ᵇ 11. διώρισται, sc. *τὰ εἰς ἃ μεταβάλλει τὸ μεταβάλλον*, or *τὰ ὑποκείμενα*.

18ᵇ 14–18. ἄλλον . . . διαφοραῖς. This is the second defence of the distinction of appellation, and it is grounded on a difference *in the degree of reality* possessed by the 'proximate matter' of the various substantial changes. The *γένεσις* or the *φθορά* of

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a *relatively more real* substance are γένεσις or φθορὰ ἁπλῶς: whilst the γένεσις or φθορά of a *relatively less real* substance are γένεσίς τις (or τινος), or φθορά τις (or τινος).

This defence of the distinction of appellation is accepted by Aristotle himself as sound. According to his own theory, the things in the universe are graded in their reality so as to form a kind of hierarchy. Their degree of reality is determined by their approximation to the absolutely real, i. e. to Substance which is ἐνέργεια ἄνευ δυνάμεως or pure Form (cf. Introd. §§ 3 and 4). Every composite substance, or formed-matter, is the ὕλη or δύναμις of a substance higher in the scale of being, and the actualization (or more perfect development) of a less-real substance. Thus, e. g., Earth, Air, Fire, and Water are the ὕλη or δύναμις of the ὁμοιομερῆ, which are themselves further developed and formed to constitute the 'organs' of the living thing's body: and the latter is the δύναμις, of which ψυχή or 'life' is the ἐνέργεια. And ψυχή itself is manifested in three main grades of reality, of which the first is related to the second, and the second to the third, as δύναμις to ἐνέργεια.

We gather from Aristotle's statements that the predicates under any Category fall into two contrasted Columns or συστοιχίαι (cf. * 19ª 14–15). One Column consists of *positive* determinations (18ᵇ 16 κατηγορία τις καὶ εἶδος: for this use of κατηγορία, cf. e. g. *Pr. Anal.* 52ª 15), the other of *privative* terms (ᵇ 17 στέρησις).

In the Category of Substance, with which we are here concerned, Fire, e. g., and Earth are differentiations of the same material, according as it is informed by 'the Hot' or 'the Cold'. But Fire is *more real* (more 'substantial') than Earth, because the διαφορά or 'constitutive quality' (cf. e. g. * 15ª 8–11, * 29ᵇ 7—30ª 29, * 29ᵇ 24–26) of Fire—viz. the Hot—is a 'positive character' or a 'form', whilst the 'constitutive quality' of Earth belongs to the privative Column. 'Cold', in fact, indicates the στέρησις of heat, i. e. its absence from a material by nature fitted to receive it.

18ᵇ 18–27. δοκεῖ . . . ἀληθές. This is the third (and most commonly accepted) defence of the distinction of appellation. Most people identify the real with the 'perceptible', and the 'imperceptible' with the unreal. Hence they call those changes, in which a *perceptible* material emerges or disappears, γένεσις and φθορά without qualification: but those in which an *imperceptible* something takes the place of, or gives place to, a perceptible substance, qualified γένεσις or φθορά.

18^{b}19. διαφέρειν, sc. *τὸ ἁπλῶς γίνεσθαι καὶ φθείρεσθαι τοῦ μὴ ἁπλῶς.*

18^{b}21–27. τὸ γὰρ . . . ἀληθές. Aristotle explains why 'most people identify the real with the *perceptible*, and the *imperceptible* with the unreal'. They treat *αἴσθησις* as equivalent to *ἐπιστήμη*, and then proceed on the principle (which Aristotle himself accepts) that 'what is knowable is real, and what is unknowable is not real'. Hence, just as they identify their own 'being' or 'life' with actual perceiving or with the power to perceive (rightly enough: cf. *Eth. Nic.* 1170^{a}13 – ^{b}19), so they suppose that the 'being' of the things—the objects of their perception—is 'to be perceived or perceivable'. From the true principle that the *esse* of animals and men is *percipere*, they draw the false corollary that the *esse* of things is *percipi*.

18^{b}27–33. συμβαίνει . . . γῆς. Aristotle contrasts the *third* defence with the *second*. The latter is in accordance with his own view, and is based on the true conception of degrees of reality and of the significance of *ἁπλῆ γένεσις* and *ἁπλῆ φθορά* (cf. ^{b}28, 32 *κατ' ἀλήθειαν*): the former is the popular view, and is based on an erroneous conception of what is more or less real and of the significance of *ἁπλῆ γένεσις* and *ἁπλῆ φθορά* (cf. ^{b}27 *κατὰ δόξαν*, ^{b}29 *κατὰ τὴν αἴσθησιν*).

According to the common opinion, e. g., Earth is *more real* than Wind or Air, since it is more perceptible: but, in truth, Wind and Air are *more real* than Earth, since they have a more 'positive being' than it. Hence, e. g., the transformation of Air into Earth is really *φθορά*, but is commonly and erroneously called *γένεσις*.

In ^{b}30, *ἁπλῶς* must be taken with *φθείρεσθαι*.

18^{b}33–35. τοῦ . . . αἴτιον. 'We have now explained why there is *unqualified coming-to-be* (though it is a passing-away-of-something), and why there is *unqualified passing-away* (though it is a coming-to-be-of-something).'

Bonitz's excision of *τήν* before *ἁπλῆν* in ^{b}34 is wrong.

19^{a}3–14. τοῦ . . . γίνεσθαι. Having explained *the first* apparent anomaly of linguistic usage, Aristotle now turns to *the second* (cf. * 18^{a}27—19^{a}22, * 18^{a}33–35).

The distinction of appellation here depends on the Category to which the change (the thing *qua* changing) belongs. *Substantial change* is—and is rightly called—*γένεσις* or *φθορὰ ἁπλῶς*: but *change in any other Category* is—and is rightly called—*γένεσις* or *φθορά τις*.

τοῦ δὲ (a 3) answers τοῦ μὲν οὖν (18b 33). Aristotle was going to say τὸ αἴτιόν ἐστιν ὅτι κτλ.: but the parenthesis (a 5–11) has disturbed the construction, and the sentence finishes irregularly (a 11 ταῦτα . ... κατηγορίαις: δὲ is resumptive).

19a 12. τὰ μὲν . . . ποσόν. 'For some of the things which are said to come-to-be signify a *this-somewhat*, others a *such*, and others a *so-much*.'

Thus by τὸ φυόμενον we mean a certain kind of thing or 'substance', the growing substance or plant. But by τὸ μανθάνον we mean a 'substance' *qua* in a certain state or condition, and by τὸ τρίπηχυ a 'substance' *qua* of a certain length. When, therefore, τὸ μανθάνον (or τὸ τρίπηχυ) is that which γίνεται, the process is really a change of state or quality (or a change of length or quantity). The 'substance' does not, *qua substance*, enter into the process, but only in respect to its quality or quantity. But when τὸ φυόμενον is that which γίνεται, the change is the emergence of a new 'substance' (the transformation of the seed into the plant). The 'substance' *qua substance* enters into the change, and the change is ἁπλῆ γένεσις.

19a 14–17. οὐ . . . ἀνεπιστῆμον: on the significance of these lines, see Alexander (quoted by Philoponos) and * 18a 27—19a 22.

19a 14–15. κατὰ . . . συστοιχίᾳ. Cf. * 18b 14–18. On συστοιχία, see Bonitz, *Ind.* s.v., and *Comment. in Arist. Metaph.*, pp. 81 and 497.

ἡ ἑτέρα συστοιχία means 'the one Column of the two': the context determines *which* of the two Columns is intended. Thus, in *Phys.* 201b 25 and *Metaph.* 1004b 27 ἡ ἑτέρα συστοιχία is the Column of privative terms: but in *Metaph.* 1072a 31 and here the phrase clearly means the Column of positives. Hence F's reading (ἑτέρᾳ τοῦ κρείττονος συστοιχίᾳ) is unnecessary, though it gives the right sense.

19a 18. καὶ ὅλως . . . αὐταῖς, 'both in general' (19a 11–14), 'and in the special case when the changing things are substances and nothing else' (18a 35—19a 3).

19a 22–29. ἀλλὰ . . . ὄντος. The perpetuity of γένεσις, as Aristotle has explained, is really a perpetual transformation, the possibility of which depends upon the nature of πρώτη ὕλη.

He now shows that the argument formulated above (18a 13–23), to prove that perpetual γένεσις is impossible, involves a fallacy and does not constitute a genuine difficulty at all. For it depended upon the assumption that τὸ φθειρόμενον passes-away into τὸ μὴ ὄν,

and that τὸ γιγνόμενον comes-to-be out of 'what is'. But (i) if τὸ μὴ ὄν means '*nothing*', it is false that φθορά is a passing into τὸ μὴ ὄν: whilst (ii) if τὸ μὴ ὄν means '*the imperceptible*', then, though it is true that φθορά is a passing into τὸ μὴ ὄν, it is equally true that γένεσις is 'out of' τὸ μὴ ὄν.

The whole appearance of a difficulty rests on a confusion between two senses of τὸ μὴ ὄν. In the popular sense τὸ μὴ ὄν is simply τὸ ἀναίσθητον: and the material 'out of' which a thing comes-to-be, and 'into which' it passes-away, may be 'imperceptible' and therefore μὴ ὄν—and yet it is not *nothing*, but ὄν τι.

19ª 25–26. εἴτ' . . . ὄντος. A thing γίνεται ἐκ μὴ ὄντος (i. e. ἐξ ἀναισθήτου), whether 'that out of which it comes-to-be' is, or is not, something:—i. e. the imperceptibility of the material is irrelevant to the question of its 'being' or 'not-being'.

19ª 28 and 29. τοῦ μὴ ὄντος, sc. τοῦ ἀναισθήτου.

19ª 29 – ᵇ 4. ἀλλὰ . . . αὐτό. The 'matter' of substantial change is μὴ ὄν in the popular sense of 'imperceptible'. But, according to Aristotle's own theory, it is also μὴ ὂν ἁπλῶς: for it is δυνάμει τις οὐσία, ἐντελεχείᾳ δὲ οὔ, i. e. it *is* not, unless you qualify 'is' and say it 'is-potentially' (cf. * 17ᵇ 14–18, * 17ᵇ 15). This 'matter' is πρώτη ὕλη, and the substantial changes primarily in question are the reciprocal transformations of τὰ ἁπλᾶ σώματα, viz. Earth, Air, Fire, and Water (cf. Introd. § 10). Aristotle speaks of them here as τὰ ἐναντία (ª 30). They are, as we shall learn (cf. B. 1–3, with the notes), the first concrete substances resulting from the information of πρώτη ὕλη by the coupled 'contrary qualities' (Cold–Dry, Hot–Moist, Hot–Dry, Cold–Moist). Two questions concerning this 'matter' are here discussed.

First Question (ª 29–33):—In the transformation of one elementary body into another, are we to identify one of the two with τὸ μὴ ὂν ἁπλῶς, i. e. with πρώτη ὕλη? The answer is in the negative. The 'matter' in this sense is the matter equally of both. They are formations of it; in each formation one of two contrasted qualities determines it so that it is something ὄν, an actual substance.

Second Question (ª 33 – ᵇ 4):—Is the matter of each of the elementary bodies different? The answer is that it is *in one sense* the same for them all, but *in another sense* different in each of them.

19ª 30–31. οἷον . . . κοῦφον ὄν. Earth is contrasted with Fire as

the heavy with *the light* (cf. Introd. § 10): but (cf. 29ᵇ 20–24) this Contrariety plays no part in the transformation of the 'simple bodies'. It is a pity that Aristotle did not here illustrate from the Contrarieties of Hot–Cold and Dry–Moist, on which the transformation depends. Perhaps the reason is that Fire, though it is hot–dry, is primarily hot: and Earth, though it is dry–cold, is primarily dry (cf. 31ª 3–6). Hence Earth and Fire are not obviously *ἐναντία* to one another in respect to these Contrarieties.

19ª 31–33. *ἢ . . . ὡσαύτως;* 'Or, on the contrary, does "what is" include Earth as well as Fire, whereas "what is not" is matter—the matter of Earth and Fire alike?'

19ª 33 – ᵇ 1. *καὶ . . . ἐναντίων.* 'And again, is the matter of each different? Or is it the same, since otherwise they would not come-to-be reciprocally out of one another, i. e. contraries out of contraries?'

19ᵇ 3–4. *ὃ . . . τὸ αὐτό.* 'For that which underlies them, whatever its nature may be *qua* underlying them, is the same: but its actual being is not the same.'

The matter of Earth, Air, Fire, and Water, conceived simply as that which undergoes transformation (i. e. *πρώτη ὕλη*), is 'the same'. But it exists only in its various informations: and the informed-matter, which is e.g. Air, is different from the informed-matter which is Water.

The familiar Aristotelian formula *ἔστι μὲν τὸ αὐτό, τὸ δ' εἶναι οὐ τὸ αὐτό* is used to express that A and B are 'materially' (potentially, or abstractly considered) identical, but 'formally' (actually, or concretely considered) different: cf. e.g. * 22ª 25–26.

A. 4

19ᵇ 6—20ª 7. *περὶ . . . τρόπον.* In this chapter the distinction between *ἀλλοίωσις* and *γένεσις καὶ φθορά* (formulated above, 17ª 20–27) is restated a little more precisely: and *ἀλλοίωσις* is marked off from *αὔξησις καὶ φθίσις* and from *φορά*, which together with it constitute the three *εἴδη κινήσεως* in contrast to 'substantial change' (cf. * 17ᵇ 34–35).

The account of *ἀλλοίωσις* in this chapter is, however, still too wide, and it has to be corrected and supplemented by the *Physics* and by subsequent statements in the present work.

The doctrine of the *Physics* (224ª 21—226ᵇ 17) is as follows. Change (*μεταβολή*) is *either* (a) from a *ὑποκείμενον* to a *μὴ ὑποκείμενον*, or conversely from a *μὴ ὑποκείμενον* to a *ὑποκείμενον*.

The first of these changes is *φθορά* and the second *γένεσις*: and their 'poles' (viz. *ὑποκείμενον* and *μὴ ὑποκείμενον*) are contradictorily opposed to one another. *Or* (b) change is from a *ὑποκείμενον* in one state to that *ὑποκείμενον* in a contrary state. All change of this kind is *κίνησις*, and it is subdivided into three species. For the 'poles' of the *κίνησις* may be (i) contrary 'states' in the Category of Quantity; i. e. the Substance may change in size, and the *κίνησις* is then Growth or Diminution: or (ii) contrary 'states' in the Category of Place; i. e. the Substance may change its position, and the *κίνησις* is then Motion (*φορά*): or (iii) contrary 'states' in the Category of Quality; i. e. the Substance may change its *πάθη* (its perceptible qualities), and the *κίνησις* is then Alteration (*ἀλλοίωσις*). The 'poles', between which every *κίνησις* takes place, are 'contraries': but Aristotle includes under this head *τὰ μεταξύ*, because they function, in relation to one another or in relation to either extreme (or 'contrary' proper), as contraries. Thus, e. g., an *ἀλλοίωσις* may be the passage from hot to cold, from white to black, from sweet to bitter, &c.: these qualities are *ἐναντία* to one another and constitute *ἐναντιώσεις*. But an *ἀλλοίωσις* may also be from hot to warm or from warm to cold, from white to grey or to any other intermediate shade of colour, &c.:—i. e. between intermediates on the scales of temperature, colour, taste, &c.

19^b 8–10. *ἐπειδὴ . . . τούτων.* Cf. * 17^a 23–27. Change in the *πάθη* (provided certain conditions are fulfilled, which Aristotle specifies immediately) is Alteration. But it is not here explained *what πάθη* are the 'poles' of *ἀλλοίωσις*, and we have to supplement Aristotle's account from other passages.

Aristotle here (e. g. 19^b 33) and elsewhere describes *ἀλλοίωσις* as *κίνησις κατὰ τὸ ποιόν*. Now in the *Categories* (8^b 25—10^a 26) four main types of *ποιότης* are distinguished, viz. (i) *ἕξις καὶ διάθεσις*, (ii) *δυνάμεις καὶ ἀδυναμίαι φυσικαί*, (iii) *παθητικαὶ ποιότητες καὶ πάθη*, and (iv) *σχῆμα καὶ μορφή*. The examples of *ἀλλοίωσις* given just below (19^b 12–14) are (a) 'change from illness to health' and *vice versa*, i. e. change of *ἕξις* or *διάθεσις* (*Categ.* 8^b 35 ff.), and (b) 'change from spherical to angular' and *vice versa*, i. e. change of *σχῆμα* or *μορφή* (*Categ.* 10^a 11–16). Nevertheless Aristotle expressly denies (cf. *Phys.* 245^b 3 ff.) that change of figure or shape, and change of *ἕξις* (i. e. acquisition or loss of a *ἕξις*) are *ἀλλοιώσεις*. He insists (cf. e. g. *Phys.*, 2nd version, 244^a 27 – ^{b} 25; *Metaph.* 1022^b 15–18) that the term *ἀλλοίωσις*

properly applies only to change of those qualities which are the objects of the five special senses, i. e. the qualities which constitute the 'contrarieties' of Touch, Vision, Hearing, Taste, and Smell (cf. also * 31a 8–10). Such qualities are classed in the *Categories* (9a 28 ff.) as παθητικαὶ ποιότητες καὶ πάθη, because all of them (with the exception of black, white, and the colours, which are called παθητικαὶ ποιότητες for another reason) 'produce a πάθος in our senses'.

19b 10–12. ἀλλοίωσις . . . μεταξύ. Change in the πάθη is ἀλλοίωσις, provided (a) that the Substance, which is changing its πάθη, is *perceptible* and persists unaltered through the change, and (b) that the 'contrary' or 'intermediate' πάθη in question (the 'poles' of the change) are predicable directly of the persisting perceptible Substance as its own (b11 ἐν τοῖς ἑαυτοῦ πάθεσιν).

The *first proviso* is necessary, because even in γένεσις and φθορά *some* ὑποκείμενον (viz. πρώτη ὕλη) persists through the change. But in ἀλλοίωσις the persistent ὑποκείμενον must be 'perceptible', i. e. a συνθετὸς οὐσία (cf. Introd. p. xxxiii$_4$).

The *second proviso* (I owe the following interpretation to Zabarella) is also necessary to distinguish ἀλλοίωσις from γένεσις and φθορά. Thus, e. g., in the transformation of Air into Water (which is a γένεσις and φθορά) the Hot–Moist is transformed into the Moist–Cold. The passage is a change from the πάθος *Hot* to the πάθος *Cold*: but it is not ἀλλοίωσις, because there is no persistent perceptible ὑποκείμενον of which hot and cold are directly predicable. There is, indeed, a persistent perceptible ὑποκείμενον: for both Air and Water are σῶμα διαφανές. But hot and cold are not properties directly predicable of 'transparent' or 'transparent body': it does not possess them as 'its own' πάθη. Air, which is transparent, is also hot: and Water, which is transparent, is also cold. But hot and transparent (or again, cold and transparent) are πάθη coexisting in the same subject; just as e. g. λευκός and μουσικός coexist in Sokrates, without being directly and properly predicable one of the other (cf. also * 19b 26–27).

19b 12–14. οἷον . . . ὤν. Though these examples are not instances of ἀλλοίωσις strictly-speaking (cf. * 19b 8–10), they illustrate the persisting identity of the ὑποκείμενον in ἀλλοίωσις. On χαλκός, see * 28b 12–13.

19b 14–21. ὅταν . . . ἀναίσθητον. ὅλον (b 14), as Zabarella points out, does not mean that, in γένεσις or φθορά, *the whole* substance

changes: for *πρώτη ὕλη* persists unchanged. The substance changes *as a whole*, i.e. as *this* specific information of matter. The change affects the combination of form and matter, which makes the thing what it specifically is.

ὡς ὑποκειμένου (^{b}15), i.e. something perceptible may persist, but not a something, of which the new form is predicable in the way in which a *πάθος* is predicable of its Substance: cf. * 19^{b} 10–12, * 19^{b} 21–24.

πάσης, παντός (^{b}16, 17) must not be interpreted merely in a quantitative sense. Aristotle's point is that the seed or air *as a whole* (in its 'substance', its specific character) has been transformed.

ἤδη (^{b}17), i.e. a change of this kind is no longer merely *ἀλλοίωσις*: we are already in presence of *γένεσις* and *φθορά*.

19^{b}16. οἷον . . . πάσης. It was objected, Zabarella says, that 'the seed comes-to-be out of the blood, not the blood out of the seed'. He suggests that Aristotle is referring to the common (though erroneous) belief 'semen in utero transmutari in sanguinem, i.e. in embryonem qui sanguineus esse videtur'.

19^{b}18–21. μάλιστα . . . ἀναίσθητον. Since the popular identification of *γένεσις* and *φθορά* with the change from 'imperceptible' to 'perceptible' and *vice versa* has already been repudiated (cf. 18^{b}18–33), we must interpret Aristotle's words here as meaning that such changes are the most obvious and generally-recognized instances of *γένεσις* and *φθορά*.

19^{b}21–24. ἐν . . . ἀλλοίωσις. 'But if, in such cases, any property belonging to a "contrariety" persists in the thing that has come-to-be, the same as it was in the thing which has passed-away—if, e.g., when water comes-to-be out of air, both are transparent or cold—the *second* thing, into which the *first* changes, must not be a property of this persistent identical something. Otherwise the change will be Alteration.'

The point of this passage is to enforce and explain the qualification *ὡς ὑποκειμένου* (^{b}15) in the definition of *γένεσις*: in a change, which is *γένεσις*, nothing *perceptible* can persist *as the subject of which the new form is predicable*. Otherwise the change would be *ἀλλοίωσις*: for we should have a persistent perceptible substance changing in 'its own' *πάθη* (cf. * 19^{b} 10–12).

In ^{b}23–24 *θάτερον εἰς ὃ μεταβάλλει* is the subject, and *πάθος* the predicate. The antecedent of *τούτου* (^{b}23) is the *πάθος ἐναντιώσεως* of ^{b}21.

In b 23 there is no reason to alter the manuscripts' reading *ψυχρά*. Aristotle is not saying that water and air are in fact 'cold', but only quoting a common view in illustration. Air, according to Aristotle, is Hot–Moist (cf. e. g. 30b 4): but Philoponos (p. 224, ll. 13–16) tells us that it was thought to be Cold–Moist.

19b 25–31. οἷον . . . τοιαῦτα. I follow Philoponos in transposing *νῦν . . . ὑπομένοντος*, which the manuscripts read after *φθορά* in l. 30.

Translate:—'Suppose, e. g., that *the musical man* passed-away and *an unmusical man* came-to-be, and that *the man* persists as something identical. Now, if "musicalness and unmusicalness" had not been a property essentially inhering in man, these changes would have been a coming-to-be of unmusicalness and a passing-away of musicalness: but in fact "musicalness and unmusicalness" are a property of the persistent identity, viz. man. (Hence, as regards *man*, these changes are "modifications"; though, as regards *musical man* and *unmusical man*, they are a passing-away and a coming-to-be.) Consequently such changes are Alteration.'

Aristotle's doctrine is:—(i) If 'musicalness and unmusicalness' were not a property of man, the change in which 'a musical man becomes unmusical' would be a *φθορά* of *musicalness* and a *γένεσις* of *unmusicalness*. But (ii) since 'musicalness and unmusicalness' are a property of man, the change is in fact an Alteration of man from a state of musicalness to a state of unmusicalness. At the same time, (iii) the change is a *φθορά* of *musical man* and a *γένεσις* of *unmusical man*.

In b 29 *πάθη* apparently means *ἀλλοιώσεις*—a sense of the term expressly recognized in *Metaph.* 1022b 18. This interpretation, though difficult, is helped by the antithesis, *ἀνθρώπου μὲν . . . πάθη, ἀνθρώπου δὲ μουσικοῦ . . . γένεσις καὶ φθορά*.

19b 26–27. εἰ . . . ἀμουσία. The singular (*πάθος*) is used, because the whole *ἐναντίωσις* is predicable of Man, as 'odd-or-even' is predicable of Number and 'straight-or-curved' of Line. 'Musical-or-unmusical' is a *disjunctive proprium* of Man, and is a *καθ' αὑτὸ πάθος* of Man in that sense (cf. Introd. § 8).

But *ἀλλοίωσις* is not confined to change in *πάθη* which are *propria*, and 'musical-or-unmusical' is a *καθ' αὑτὸ πάθος* of Man in a wider sense also.

Man can 'alter' from musical to unmusical, because Man is the 'owner' of this *πάθος*—the *substratum*, in which it inheres, and not merely a subject of which it can grammatically be predicated. On the other hand, *τὸ λευκόν* could not 'alter' from

musical to unmusical, because 'musical or unmusical' is a *πάθος* of *τὸ λευκόν* only *κατὰ συμβεβηκός*, not *καθ' αὑτό*. It is indeed *grammatically possible* to say *τὸ λευκόν ἐστι μουσικόν*, but the statement only means that an unexpressed *substratum* (e. g. Sokrates), *ᾧ συμβέβηκεν εἶναι λευκῷ*, is also musical. Cf. 21[b] 3–4, * 19[b] 10–12, *Post. Anal.* 83[a] 1–21.

19[b] 31—20[a] 2. ὅταν . . . φθορά. A summary statement of the distinction of the three *εἴδη κινήσεως* (a) from one another, and (b) from substantial change.

κατὰ . . . ποιόν ([b] 33), i. e. *πάθος* is to be interpreted as *παθητικὴ ποιότης*: cf. * 19[b] 8–10.

πάθος . . . ὅλως ([a] 1), i. e. *πάθος* is to be interpreted in the widest sense, so as to include all forms of 'Accident'.

20[a] 2–5. ἔστι . . . τινων. *Matter* in the primary and strict sense is identical with the *substratum* of substantial change (*ὕλη γεννητὴ καὶ φθαρτή*). But the other forms of change also presuppose a *substratum* which is-potentially, but is-not-actually, that which results from the change. Hence we must recognize a *ὕλη πόθεν ποῖ* (or *ὕλη τοπική*), a *ὕλη* of *αὔξησις καὶ φθίσις*, and a *ὕλη* of *ἀλλοίωσις*. Cf. Introd. p. xxxiv, *Metaph.* 1042[a] 32 – [b] 7.

20[a] 5–7. περὶ . . . τρόπον. The first part of this epilogue refers back to 15[a] 26–27.

After *γενέσεως* ([a] 5) Bekker adds *καὶ φθορᾶς*, which he wrongly attributes to E. The addition is not wanted: cf. 19[b] 6.

A. 5

20[a] 8. περὶ . . . εἰπεῖν. *λοιπόν*: the reference is to the plan of the work, cf. 14[a] 1–6, 15[a] 26–28.

The processes hitherto considered (*γένεσις* and *φθορά*, *ἀλλοίωσις*) occur in all sublunary natural bodies. But growth and diminution, as here defined (cf. * 20[b] 34—21[a] 29), are the two complementary forms of a process which is confined to the *ἔμψυχα*. We should therefore expect to find them discussed in Aristotle's treatises on living things. And he does in fact treat (a) of food, and the bodily organs involved in assimilation, nutrition, and growth in the *de Part. Anim.*, (b) of the organs of reproduction in the *de Gen. Anim.*, and (c) of the soul (as the efficient cause of nutrition, growth, and reproduction) in the *de Anima*. Moreover, there are grounds for thinking that he wrote—or at least planned—a special treatise *περὶ τροφῆς* or *περὶ αὐξήσεως καὶ τροφῆς*: see Bonitz, *Ind.* 104[b] 16–28. Nevertheless it is natural enough that the present

work should include a treatise on *αὔξησις καὶ φθίσις*. For (i) the four kinds of change are distinguished in the *Physics*, and *φορά* is discussed there and in the *de Caelo*. And since Aristotle has just discussed *γένεσις* and *ἀλλοίωσις*, the investigation of growth and diminution—the remaining kind of change—is appropriate here. Moreover (ii) *αὔξησις* (as we shall discover) is most intimately connected with *γένεσις* and *ἀλλοίωσις*, and cannot be explained without them. Hence it is convenient to treat of the general character of *αὔξησις* in close association with the treatment of *γένεσις* and *ἀλλοίωσις*.

The passage in the *de Anima* (B. 4, especially 416^{a} 19 – ^{b} 31) supplements Aristotle's present account. We learn from it that the primary or basal soul (*ἡ πρώτη ψυχή*, i. e. the soul whose functions *distinctively* characterize the lowest grade of *ἔμψυχα*, viz. the plants) is the 'efficient cause' of all those vital acts which operate with food. For (i), as converting food into the substance of the tissues of the *ἔμψυχον*, this soul is *θρεπτική*, i. e. originates the processes of nutrition; (ii), as employing the assimilated food to increase the living body up to the size which it possesses in maturity, it is *αὐξητική*, i. e. originates and controls the process of growth; and (iii), as winning from the food that secretion (viz. the seed) from which a new specimen of the living body can develop, it is *γεννητική*, i. e. originates and controls the reproductive process. Since the aim and end of this soul is to reproduce the living body of which it is the 'form' (*τὸ γεννῆσαι οἷον αὐτό*), and since it is best to call things after their 'end', the basal soul may be called *γεννητικὴ οἷον αὐτό*. It is the 'reproductive' soul *par excellence*, since its other functions are subservient and instrumental to reproduction.

Aristotle's terminology in the *de Anima* should also be noted in connexion with the present passage. The soul is *τὸ τρέφον*—that which nourishes: the living body *qua* living (*τὸ ἔμψυχον ἢ ἔμψυχον*) is *τὸ τρεφόμενον*—that which is nourished: the food is that *ᾧ τρέφεται*, the 'stimulus' (cf. * 21^{b} 5–6), i. e. that which stimulates the *θρεπτικὴ δύναμις* to exercise its power: and the natural heat of the living body (*τὸ θερμόν*: cf. * 29^{b} 24–26) is that *ᾧ τρέφεται*, i. e. that which the soul employs as the instrument of nutrition, to digest and assimilate the food.

20^{a} 9–10. *καὶ πῶς . . . φθινόντων*, i. e. we have to explain the general character of the processes of growth and diminution wherever they occur: cf. * 14^{a} 2, * 18^{a} 25–27.

20ª 10—22ª 33. σκεπτέον . . . μένει. The chapter discusses two topics (20ª 8–10), viz. (i) how growth is distinguished from coming-to-be and from alteration, and (ii) how growth takes place. It may be divided into two parts. The first part (20ª 10–ᵇ 34) contains a preliminary and somewhat confused treatment of both topics. Thus, the difference of *αὔξησις* from *γένεσις* and *ἀλλοίωσις* is considered, but not adequately stated (20ª 10–27); and there is an obscure and unsatisfactory discussion whether (and, if so, in what sense) the matter, out of which things grow, is *potentially* *μέγεθος* (* 20ª 27 – ᵇ 34). The second part (20ᵇ 34—22ª 33) distinguishes growth from *γένεσις* and *ἀλλοίωσις* by a precise definition of the term: and elucidates the way in which growth takes place, by an account of the nature of the growing thing, of the part played by food in growth and the relation of nutrition to growth. Cf. also * 21ᵇ 10–16.

20ª 12. ὅτι, sc. *ἐστὶν ἡ πρὸς ἄλληλα διαφορὰ ὅτι κτλ.*, 'Do they differ from one another, because . . .'

20ª 13. οἷον, *videlicet.* Cf. e.g. 21ª 35, 26ª 27.

20ª 15. ἀμφότερα, i.e. the last two forms of change, *αὔξησις* and *ἀλλοίωσις.*

20ª 16. τῶν εἰρημένων. *τὰ εἰρημένα* are *μέγεθος* and *πάθος.*

20ª 16–25. ἢ . . . φθίνοντος. Growth and diminution are *necessarily* accompanied respectively by the expansion and contraction of the growing and the diminishing thing in all three dimensions of space. This phenomenon *may* accompany *γένεσις* and *ἀλλοίωσις*, but it *need not* do so. From this peculiar necessary concomitant Aristotle infers that the change, which is growth (or diminution), must be distinguished 'in manner' from the changes which are *γένεσις* and *ἀλλοίωσις*: but we are not here told what this 'distinctive manner' is.

20ª 19–25. ἄλλον . . . φθίνοντος. The change of place, which necessarily accompanies growth and diminution, (a) is not a movement of translation. For the growing or diminishing thing *as a whole* retains its position, although its parts change their places as it expands or contracts: whereas the moving body, in a movement of translation, changes its position as a whole. Nor (b) is it a movement of rotation, like that of a revolving sphere. For the sphere as a whole continues to occupy an equal space, within which its parts change their places: but the parts of the growing thing expand, and those of the diminishing thing contract.

Aristotle here (ª 20–21) compares the expansion of the growing

thing to that of a metal when beaten. Even this comparison, however, is inaccurate (as Philoponos points out) because the growing thing expands in all three dimensions of space at once.

τούτου (ª 21), sc. τοῦ αὐξανομένου.

In the *Physics* (211ª 12–17, 213ᵇ 5) φορά is quoted as one type of κίνησις ἡ κατὰ τόπον, and αὔξησις καὶ φθίσις as the other.

20ª 27 – ᵇ 34. περὶ . . . αὔξησις. It has been suggested that the sphere in which growth operates (its περὶ ὅ) is μέγεθος, i. e. that growth is a change from 'potential' to 'actual' μέγεθος (20ª 12–16). Starting from this suggestion, Aristotle discusses in what sense the *terminus a quo* of growth is δυνάμει μέγεθος. He is thus inquiring 'What is the matter out of which things grow?' And this inquiry is at the same time a preliminary investigation of the problem, 'How does growth take place?' (cf. * 20ª 10—22ª 33).

But the discussion is obscure in many of its details. This obscurity is largely due to the fact that Aristotle has not yet pointed out that there is a twofold matter of growth :—viz. (i) the *materia in qua*, i. e. τὸ αὐξανόμενον, the growing thing itself, and (ii) the *materia ex qua*, i. e. τὸ ᾧ αὐξάνεται, the food (cf. * 20ᵇ 34—21ª 29). Hence 'the matter of growth', of which he here speaks, includes *both* 'the growing thing' and 'the food': and the emphasis falls sometimes on one, and sometimes on the other, of these two aspects of 'the matter'.

The general conclusion is that the περὶ ὅ of growth is μέγεθος, in the sense that growth is a change of, and within, actual μέγεθος. Thus 'the growing thing' must be an actual body which already possesses some actual magnitude (cf. e. g. 20ᵇ 31–33): and the same is true, as we learn later, of 'the food'. Nevertheless the matter of growth is also in a certain sense (cf. * 20ª 29, * 20ᵇ 12–14) *only potentially* a body and a magnitude, which it will become *actually*. This is clearly explained in respect to 'the food' (cf. 21ᵇ 35—22ª 33): but it is also true of 'the growing thing', as we can infer from 20ᵇ 12–25.

20ª 29. ποτέρως ὑπολεπτέον. That the περὶ ὅ of αὔξησις καὶ φθίσις is μέγεθος, is generally believed: but a special interpretation of the relation of a change to its περὶ ὅ has been suggested (20ª 12–16), according to which growth would be 'a process from what is potentially, to what is actually, a magnitude'. Now this description is ambiguous, and the ambiguity lies in the phrase ἐκ δυνάμει μεγέθους. Aristotle expresses only one of its two possible meanings here: viz. that growth is a process, in which σῶμα καὶ μέγεθος

result from a matter *actually incorporeal and devoid of magnitude*, though potentially magnitude and body. And the main object of the ensuing discussion is to negative this description of growth.

According to the other possible meaning of ἐκ δυνάμει μεγέθους (which is not here directly stated, though it is implied below: see * 20^{b} 12–14), the matter of growth would be *actually* corporeal and *actually* possessed of magnitude, though only *potentially* 'corporeal and possessed of magnitude' *in the same sense in which the result of growth is actually so.* The main result of the later discussion (from 20^{b} 34 onwards) is to explain and justify this conception of the matter of growth.

20^{a} 29–31. πότερον . . . μέγεθος; Growth, as we shall learn later, presupposes nutrition, i. e. the transformation of food into (e. g.) flesh, or the γένεσις of a σῶμα. Now, since γένεσις is transformation, nutrition—*qua* the γένεσις of a σῶμα—presupposes an already formed matter (i. e. an actual σῶμα), and not an incorporeal matter.

Hence the view here suggested—that in growth σῶμα καὶ μέγεθος come-to-be out of a matter which is actually incorporeal and sizeless—is clearly false, at least in so far as 'the matter' means or includes *the food* (cf. * 20^{a} 27 – ^{b} 34), which the phraseology implies.

20^{a} 31–34. καὶ τούτου . . . ἀμφοτέρως; The matter of growth (we are supposing at present) is *actually* incorporeal and *actually* devoid of magnitude. It is no mere feature of actual body, which we can isolate by definition. It is an incorporeal and sizeless something, having an independent existence, really 'separate' from what is corporeal and possessed of magnitude (^{a} 33 κεχωρισμένης, ^{a} 34 χωριστή).

But an incorporeal and sizeless matter, which is thus real independently of body, may be supposed *either* (a) to exist alone, *per se*; *or* (b) to exist within (to 'inexist in') an actual body, without being in any sense a part of the body which contains it (^{a} 33–34: the matter is supposed to be κεχωρισμένη in *both* alternatives). Is growth a process in which σῶμα καὶ μέγεθος result from (a), or from (b)? Aristotle is going to show that growth cannot take place in either of these two ways (^{a} 34 ἢ ἀδύνατον ἀμφοτέρως; sc. τὴν αὔξησιν γίγνεσθαι, cf. ^{a} 32).

τούτου (^{a} 31), sc. τοῦ ἐκ δυνάμει μὲν μεγέθους καὶ σώματος, ἐντελεχείᾳ δ' ἀσωμάτου καὶ ἀμεγέθους γίνεσθαι σῶμα καὶ μέγεθος.

20ª 34 – ᵇ 2. ἢ . . . αἰσθητόν. Both alternatives are impossible, because both assume an incorporeal and sizeless matter which is 'separate': and if it is 'separate', it must be conceived *either* (a) as occupying no place, *or* (b) as a 'void'. But (20ᵇ 2–12) it cannot be conceived in either of these two ways.

By the excision of ἤ before οἷον (ᵇ 1), we get two alternative ways of conceiving the 'separate' matter, and τὸ μέν (ᵇ 2) and τὸ δέ (ᵇ 3) become intelligible. *The first alternative way* (a) is that the matter 'occupies no place', and Aristotle suggests 'the point' as an illustration. For though the point 'possesses position' (θέσιν ἔχει), it cannot be said to 'occupy place' (τόπον κατέχειν), since nothing can 'occupy place' except κινητὸν σῶμα, i. e. a body subject either to φορά or to αὔξησις: cf. Aristotle's discussion of τόπος, *Physics* Δ. 1–5, e. g. 212ª 5–7, ᵇ 7–8, 28–29. *The second alternative way* (b) is that the matter is 'a void'. Now Aristotle explains, in the passage of the *Physics* (Δ. 6–9) where he argues that there is no 'void', what τὸ κενόν is commonly supposed to mean. By τὸ κενόν is meant a διάστημα ἐν ᾧ μηδέν ἐστι σῶμα αἰσθητόν: i. e. there is supposed to be a place filled (or capable of being filled) by tangible body, and then, within this filled place, a gap devoid of tangible body (cf. *Physics*, l. c., 213ª 27–31, 213ᵇ 31—214ª 11). Hence the words καὶ σῶμα οὐκ αἰσθητόν (ᵇ 2) are rightly added here, as explanatory of κενόν. If the matter is 'a void', it is the empty place of a perceptible (i. e. tangible) body. It is the spatial content of a body, a body without the perceptible qualities of a body.

20ᵇ 3. τὸ . . . εἶναι. τὸ δέ, sc. κενὸν καὶ σῶμα οὐκ αἰσθητόν.

ἔν τινι εἶναι, i. q. ἐνυπάρχειν ἐν ἄλλῳ σώματι (20ª 34).

To identify the 'incorporeal separate matter' with 'a void' is to suppose that it exists independently within another body; and we are therefore maintaining *the second alternative formulated above* (20ª 34: cf. * 20ª 31–34). Aristotle shows that this alternative is untenable, 20ᵇ 5–12.

20ᵇ 3–5. ἀεὶ . . . συμβεβηκός. (a) *The matter of growth cannot be conceived as occupying no place.*

Aristotle's argument may be put thus:—What results from the matter of growth (viz. a body possessed of magnitude) is καθ' αὑτό (*per se*, intrinsically) *somewhere* (πού). Hence the matter must be *somewhere*, either 'intrinsically' (*per se*), or at least 'indirectly' (κατὰ συμβεβηκός, *per aliud*). But 'that which does not occupy place'—e. g. a point—is not *somewhere*, either *per se* or *per aliud*.

The argument turns on the meaning of 'being somewhere' (*εἶναί που*), which is explained in the *Physics*. 'To be *πού*' is 'to be *ἐν τόπῳ*': and this means to be contained by an including body, in such a way that the 'limits' or mathematical outlines (*τὰ ἔσχατα, τὰ πέρατα*) of the contained and its continent are 'in contact'. When that is so, the outline of the *contained* body is its *μορφή* or *εἶδος*: and the outline of the *continent* is 'the primary place' (*τόπος ἐν ᾧ πρώτῳ ἐστίν*, or *τόπος ἴδιος*: cf. * 16^{b} 4) of the contained body. Hence Aristotle defines *τόπος* as 'the limit of the containing body'; and explains that only a *σῶμα κινητὸν ἢ κατὰ φορὰν ἢ κατ' αὔξησιν* can be *per se* 'in place' or 'somewhere'. Other things, however, e. g. the soul, can be *πού* or *ἐν τόπῳ per aliud*: i. e. indirectly, in virtue of a *κινητὸν σῶμα* of which they are, e. g., constituents or adjectives. (Cf. *Phys.* e. g. 211^{b} 10–14, 212^{a} 5–7, 31–32, 212^{b} 7–12, 27–29.)

Now it is clear that a point is not 'in place' *καθ' αὑτό*, since it is not a *κινητὸν σῶμα*. But is it not 'in place' *κατὰ συμβεβηκός*, e.g. as a part or an adjective of some other *κινητὸν σῶμα*? A point is 'in' a line, a line is 'in' a surface, a surface 'in' a solid: and is not a solid 'in' a *κινητὸν σῶμα*? The answer, according to Aristotle's doctrine, is 'No'. For the 'mathematical things' are not 'contained in' the actual bodies: they are adjectival characters abstracted from the latter (cf. Introd. § 5). Hence none of the 'mathematical things' are 'in place': cf. e.g. *Phys.* 208^{b} 22–25, *de Caelo* 305^{a} 24–31.

20^{b} 5–12. ἀλλὰ . . . ὑπομένοντος. (b) *The matter of growth cannot be conceived as 'contained in' an actual body, whilst retaining a 'separate' being of its own.*

If the 'incorporeal and sizeless' matter were thus *in* an actual body, without being in any sense *of* it—i. e. neither a part of its substantial being (*καθ' αὑτό*, ^{b} 4) nor an adjective of it (*κατὰ συμβεβηκός*)—it would be enclosed within it, as within a vessel. It would be a *κενόν*: and the actual body would include it, much as an *ἀγγεῖον* comprises its contents.

Such a conception of the matter of growth is impossible, as we can see from the impossibility of an analogous conception of the matter of *γένεσις*. Suppose, e. g., that, when Air comes-to-be out of Water, the matter of its *γένεσις*, whilst in no sense a part or an adjective of the Water, is 'contained within' it, as in a vessel. Then (i) the *γένεσις* of the Air would be simply its withdrawal from the Water, the latter being left unaltered; but this is not

what in fact occurs (^{b} 11–12): and (ii), since there would be nothing to limit the quantity of the matter 'contained in' the Water, there would be nothing to limit the volume of the resulting Air (^{b} 10–11). But in fact a given volume of Water generates only a determinate volume of Air.

I have followed Zabarella in my interpretation of ^{b} 10–11 (ἀπείρους . . . ἐντελεχείᾳ).

20^{b} 12–14. βέλτιον . . . μὴ μίαν. 'It is therefore better to suppose that in all instances of coming-to-be the matter is inseparable' (sc. from the actual body in which it is contained) 'being numerically identical and one with the containing body, though isolable from it by definition.'

This suggestion is the opposite of the supposition just negatived. Hence we may regard it as the affirmation of the unexpressed alternative implied in the formulation of that supposition: cf. 20^{b} 5 ff. εἰ μὲν κεχωρισμένον οὕτως κτλ. Aristotle is suggesting the *right* interpretation of ἐκ δυνάμει μεγέθους, i. e. the true sense in which the matter of growth is δυνάμει μέγεθος: cf. * 20^{a} 29.

When Air comes-to-be out of Water, the matter of this γένεσις is *really* ἀχώριστος from the Water. It is numerically identical with it. But it is distinct and isolable *by definition* (τῷ λόγῳ) from it. The same principle applies in all cases of γένεσις (^{b} 13 πᾶσιν). When, e. g., σῶμα καὶ μέγεθος 'come-to-be' (i. e. *in growth*, cf. * 20^{a} 29–31), the matter of this process is *really* inseparable from an actual body possessing magnitude. Hence the matter of growth is not an 'incorporeal and sizeless something' *with an independent being of its own* (cf. * 20^{a} 31–34). But from an actual body, actually possessed of magnitude, we can *abstract by definition* the matter of growth. The matter of growth—this abstracted feature of the actual body—is only potentially (not yet actually) that actual body of a determinate size, which will result from the process of growth: hence *in this sense, and in this sense only*, the matter of growth is δυνάμει μέγεθος καὶ σῶμα.

20^{b} 13–14. τὴν αὐτὴν . . . ἀριθμῷ, i. e. numerically identical with the actual body 'in which' it is (or rather, from which we can isolate it by definition).

The inseparability of the ὕλη of γένεσις from that of αὔξησις and of ἀλλοίωσις is a different, though a closely-connected, point which Aristotle develops below, ^{b} 22–25.

20^{b} 14–16. ἀλλὰ . . . αἰτίας. We saw that body and magnitude cannot come-to-be out of an incorporeal and sizeless something,

existing in its own right, but occupying no place: 'the matter', in short, cannot be a kind of 'point' (cf. * 20^{a} 34 – ^{b} 2, * 20^{b} 3–5).

Aristotle now urges that none of the geometrical things—viz. neither points, lines, planes, nor solids—can be 'the matter' out of which body comes-to-be. He is referring to a type of theory which he criticizes more fully elsewhere (cf. e. g. *de Caelo* 298^{b} 33 ff., *Metaph.* 1001^{b} 26 ff., 1036^{b} 7 ff.). The type of theory in question regards the products of mathematical analysis as the real primary constituents of things. From the point of view of mathematical analysis, the perceptible physical bodies 'presuppose' (are resoluble into) geometrical solids: solid presupposes the planes which define and contain it: plane similarly presupposes lines, line points, and points are arithmetical units *plus* position. Hence (it was argued) the physical bodies, with all their sensible qualities, can be generated by a gradual synthesis of the elementary mathematical entities. Units—or at least points, lines, and the geometrical figures—are 'the matter' of body.

The theories of the Atomists (cf. e. g. * 15^{b} 33—16^{a} 2) and of Plato in the *Timaeus* (cf. * 15^{a} 29–33, * 15^{b} 31) are examples (more or less imperfect) of the type which Aristotle here condemns. The fundamental error of all such theories lies in the assumption that *τὰ μαθηματικά* are independently real; whereas in fact they are adjectival features of the perceptible bodies, isolable only by definition (cf. * 20^{b} 3–5).

οὐδὲ στιγμὰς . . . οὐδὲ γραμμάς (^{b} 14–15) is, I think, equivalent to the denial that *τὰ γεωμετρικά*—i. e. the entities whose 'being' the geometer *ὑποτίθεται*, and whose essential properties he proves—can be 'the matter' of body: cf. e. g. *Post. Anal.* 76^{b} 3–5, Introd. § 6.

διὰ τὰς αὐτὰς αἰτίας (^{b} 15–16) is not very clear. The reference appears to be to the whole preceding argument (20^{a} 29 – ^{b} 12) which proves that the matter, out of which *a body* (with magnitude) comes-to-be, cannot be something actually *incorporeal* (and sizeless).

20^{b} 16–17. *ἐκεῖνο . . . μορφῆς.* Aristotle here begins the statement of his own conception of the matter out of which body (and magnitude) comes-to-be. The statement is completed in the next sentence, ^{b} 17–25.

The matter, out of which body comes-to-be, is that of which 'points and lines' are the limits: but it can never exist apart

from a definite physical shape (*μορφή*) and perceptible qualities (*πάθος*). In other words, 'the matter' is always *an actual body* having a certain shape and magnitude, and certain sensible qualities. As we shall see in a moment, however, we can *isolate by definition* different features of its being: and these isolable features are respectively (a) the *ὕλη οὐσίας σωματικῆς* (i. e. *πρώτη ὕλη*, the fundamental logical presupposition of *γένεσις*), (b) the *ὕλη* of growth and diminution, and (c) the *ὕλη* of 'alteration'.

320b 17–25. γίγνεται . . . χωριστά. Aristotle has just stated that the matter, out of which a body comes-to-be, is itself another actual perceptible body. But though this is true, and has been established elsewhere as well as in the present argument (b 17–19 *γίγνεται μὲν οὖν . . . διώρισται*), 'nevertheless' (b 22–25 *ἐπεὶ . . . χωριστά*) 'since there is also a matter out of which corporeal substance itself comes-to-be (corporeal substance, however, already characterized as such-and-such a determinate body, for there is no such thing as body in general), this same matter is also the matter of magnitude and quality—being separable from these matters by definition, but not separable in place unless Qualities' and Attributes generally 'are, in their turn, separable from Substance'.

Aristotle's doctrine may be summarized thus:—Any actual perceptible body is corporeal substance of a certain size and with certain *αἰσθητὰ πάθη*. Its *μέγεθος* and its *πάθη* are inseparable from its 'corporeal substantiality', which they qualify, and inseparable from one another: i. e. neither corporeal substance, nor size, nor any *πάθος* exists *per se* and in the abstract. What exists is *this* determinate body of such-and-such a size, and of such-and-such a temperature, colour, smell, &c. One and the same actual body (*this* individual corporeal substance) is the subject, of which a certain *μέγεθος* and certain *πάθη* are predicable: and its 'place' is the 'place' in which these adjectives (whose 'being' is their inherence in the body) inseparably coexist. On the other hand, scientific analysis may—and indeed must—distinguish the body (a) *qua πρώτη ὕλη thus*-formed, but capable of accepting a different form, (b) *qua so*-big, but capable of becoming bigger or smaller, and (c) *qua so*-hot or *so*-coloured, but capable of a different temperature or a different colour. Hence scientific analysis distinguishes within the actual body (a) a *ὕλη σωματικῆς οὐσίας*, (b) a *ὕλη μεγέθους* (i. e. a matter of growth and diminution), and (c) a *ὕλη πάθους* (i. e. a matter of alteration).

Thus the matter of growth is a certain *μέγεθος*, the matter of alteration a certain *πάθος*, and the matter of *γένεσις* the 'corporeal substantiality'—*of an actual body*. These three *ὕλαι*, though not really separable, are *separable by definition* (isolable by scientific analysis) both from the actual body and from one another.

To suppose that the matter of growth and the matter of alteration are *really separate* from the actual body or from the matter of *γένεσις*, would be equivalent to maintaining the separate existence of *πάθη*—i. e. that an actual *μέγεθος* and an actual sensible quality can 'be', without inhering in a substance. Cf. ^{b} 24–25 *εἰ μὴ καὶ τὰ πάθη χωριστά*. The term *πάθη* here includes all 'adjectivals', i. e. determinations under any Category other than that of Substance: cf. * 27^{b} 17–22. On the other hand, the word is used in ^{b} 17 and ^{b} 23 in the restricted sense of *παθητικὴ ποιότης* or *αἰσθητὸν πάθος*: cf. * 19^{b} 8–10.

20^{b} **18–21.** *ὥσπερ . . . γίνεται. καὶ ἐν ἄλλοις*: Aristotle is probably referring to *Metaph.* 1032^{a} 12 ff., rather than to *Phys.* A. 7. For in the former passage he establishes two universal laws of *γένεσις*, viz. (i) 'One actual thing comes-to-be out of another actual thing' and (ii) 'The efficient cause of every *γένεσις* is something actual'. Hence he is reminded of the second law here, and repeats it although it is not strictly relevant to his present argument. We must, then, regard ^{b} 19–21 (*καὶ ὑπό τινος . . . γίνεται*) as a digression, suggested to Aristotle by association. The words *σκληρὸν γὰρ οὐχ ὑπὸ σκληροῦ γίνεται* (^{b} 21), if they are genuine, must be read after *ὁμογενοῦς* (^{b} 19) as an explanatory parenthesis.

The doctrine may be stated thus:—The efficient cause of *γένεσις* is always 'actual', *either* (i) an actual thing, form embodied in matter, *or* (ii) an actuality, i. e. a 'form' (^{b} 21 *ἢ ὑπ' ἐντελεχείας*). (i) If it is an actual thing, it is identical (with the thing produced by the process) either (a) *in species* or (b) *in genus*. Thus (a) the father is the efficient cause of the coming-to-be of the child: and father and child are identical *specifically*. On the other hand, (b) a hard thing (e. g. ice or terra-cotta) is not produced by a hard thing, but by something cold or hot (a freezing wind or a baking fire); cf. *Meteor.* 382^{a} 22 ff. But though what is cold or hot is different in species from what is hard, 'cold', 'hot', and 'hard' are *generically* identical: for all three belong to the class of *τὰ ἁπτά*. (ii) At other times (viz. in those *γενέσεις* which are properly called *ποιήσεις*) the efficient cause is not *an actual thing*,

but an *actuality* or 'form'. When a work of τέχνη comes-to-be, the process is initiated by the 'form' *qua* present as an ideal in the soul of the τεχνίτης. Thus the efficient cause of the coming-to-be of a house is the οἰκοδομικὴ τέχνη in the architect's soul: and the οἰκοδομικὴ τέχνη *is* the 'form' of House, or *is* the λόγος in which that 'form' is precisely analysed and resynthesized. Cf. * 35b 34–35, *Metaph.* 1032a 25 ff.

20b 25. ἐκ τῶν διηπορημένων. The reference is to 20a 27 – b 12.

20b 27–28. χωριστὸν . . . πρότερον. If we suppose that the matter of growth is devoid of actual μέγεθος, we shall be postulating within it—e. g. within the growing thing, or again within the food (cf. * 21a 5–9)—real 'gaps' or 'voids', having an independent existence of their own. The growing thing (or the food) will then be conceived as a body with 'pores'—with 'places' *for* tangible body, but devoid of it (cf. * 20a 34 – b 2). But a really-existent, independent 'void' has been shown to be impossible elsewhere (*Phys.* Δ. 6–9).

Zabarella prefers the variant τὸ κοινόν, which he interprets as σῶμα οὐκ αἰσθητόν, i. e. 'corpus indifferens, potentiale, et nulli certae naturae alligatum'—or, in other words, as πρώτη ὕλη. But (i) σῶμα κοινόν in b 23 does not mean σῶμα οὐκ αἰσθητόν. It means *perceptible body in general*, i. e. the indeterminate universal of the definite perceptible bodies. And (ii) σῶμα οὐκ αἰσθητόν in b 2 is identified with τὸ κενόν, not with τὸ κοινόν.

The false reading, τὸ κοινόν, probably led to the omission of ἐν ἑτέροις in b 28. For (so far as I am aware) there is no proof ἐν ἑτέροις that τὸ κοινόν cannot exist in separation.

20b 30. ὅλως, i. q. ἁπλῶς: cf. 26a 28.

20b 33–34. γένεσις . . . αὔξησις. As Zabarella rightly observes, Aristotle does not mean that the ὕλη of γένεσις is devoid of actual magnitude, i. e. only potentially a body. All that he says is that 'a process from an ἀμεγέθης ὕλη', *if it could occur at all*, 'would not be growth, but rather (μᾶλλον) a body's coming-to-be'.

20b 34—21a 29. λεπτέον . . . τοιοῦτον. Aristotle here begins a more thorough treatment of the two topics formulated at 20a 8–10: cf. * 20a 10—22a 33. We are 'to come to closer quarters with the subject of our investigation', 'to grapple with it (as it were) from its beginning', 'to get to the root of it' (b 34—21a 1. Since ἅπτεσθαι literally applies only to something corporeal, Aristotle says οἷον ἁπτομένους. Probably μᾶλλον goes with ἁπτομένους: cf. *Rhet.* 1358a 8).

With a view to this more thorough treatment, 'we must determine the precise character of the Growing and Diminishing whose causes we are investigating' (21ª 1–2: *ποίου*, as Zabarella rightly says, 'non significat qualitatem, sed essentiam, augmentationis'). In other words: we must formulate the precise *nominal* definitions of *αὔξησις* and *φθίσις*. If we then discover the causes of growth, we shall be able to convert its *nominal* into its adequate *scientific* definition: cf. Introd. §§ 7–9, * 14ª 2–3, * 21ᵇ 16–17.

It will be convenient to anticipate Aristotle's discussion and to give a summary statement (i) of the meaning here attributed to *αὔξησις*, and (ii) of the causes of *αὔξησις*. The reader should consult *de Anima* B. 4 (cf. * 20ª 8), Alexander's *περὶ κράσεως καὶ αὐξήσεως* (ed. Bruns, pp. 233 ff.), and above all Zabarella's excellent treatise *de Augmentatione*.

(i) The term *αὔξησις* is here restricted to the growth of living things, though it is used more widely elsewhere. Thus it is applied (e.g. *Phys.* 214ª 32 ff.) to the increase of volume when 'air' (e.g. steam) is generated from water—a case expressly excluded here (21ª 9–17). A process, which is to be *αὔξησις* in the sense here recognized, must fulfil three conditions:—(a) the substance of the growing thing must persist, retaining its identity through the process, (b) the growing thing, as a whole and in every particle, must get bigger, i.e. must expand so as to become larger in all three dimensions, and (c) it must get bigger by taking into itself, and assimilating, food.

Growth, thus conceived, involves *γένεσις καὶ φθορά*, *ἀλλοίωσις*, and *φορά*. For the food must pass-away, i.e. be transformed into the tissue of the growing thing. There must, e.g., be a *φθορά* of the bread, which is a *γένεσις* of the blood. Again, in the process of digestion which growth presupposes, food and stomach reciprocally 'act' and 'react' on one another, i.e. reciprocally 'alter' one another: cf. the notes on A. 7. Or, as Aristotle also expresses it, the food is at first 'unlike' the tissues which it is to increase. It has to be 'made like' them, and this assimilation is a change from contrary to contrary qualities, i.e. *ἀλλοίωσις* (cf. *Phys.* 260ª 29 ff.; below, 21ᵇ 35—22ª 4). Finally (cf. * 20ª 16–25), growth is necessarily accompanied by a peculiar kind of *φορά*.

(ii) There is a twofold matter (i.e. material cause) of growth (cf. * 20ª 27 – ᵇ 34), viz. (a) the growing thing whose size increases:

this is a body animated by the basal or 'reproductive' soul: and (b) the food which 'accedes to', and increases, the growing thing. There is also a twofold efficient cause of growth, viz. (a) the basal soul, and (b) the 'natural heat' of the living body (cf. * 20^a 8).

Aristotle refers to the soul as the efficient cause of growth at 21^b 6–10, 22^a 12, 22^a 28–33: but his references are very brief, and the last passage is obscure. There does not appear to be any reference in this chapter to the 'natural heat'. The 'final cause' of growth (to which there is no reference here) is the attainment by the living thing of its 'normal' size—i. e. the size which it ought to have in maturity, if it is to fulfil its vital functions adequately.

The question as to what cause (or causes) must be specified in the scientific definition of growth, is discussed below: cf. * 21^b 16–17.

21^a 2–29. φαίνεται . . . τοιοῦτον. The 'nominal definitions' of *αὔξησις* and *φθίσις* (in the sense here given to these terms) emerge from this passage. The growing and diminishing thing exhibits three characteristics: growth and diminution must conform to three conditions (cf. preceding note). The first two conditions are stated at once (^{a} 2–5), whilst the third is formulated in the course of the discussion from ^{a} 9–29.

21^a 5–9. ἀναγκαῖον . . . ἀδύνατον. An *apparent* dilemma concerning the food. The datives (*ἀσωμάτῳ, σώματι*) show that Aristotle is referring to the *materia ex qua* of growth (*τὸ ᾧ αὐξάνεται*, or *τὸ αὐξον*): cf. * 20^a 8, * 20^a 27 – ^{b} 34, and the terminology throughout the rest of the chapter.

The food *must* be either *ἀσώματον* or *σῶμα*: and yet it *cannot* be either. For (a) if the food be *ἀσώματον*, 'there will exist *separate* a void' (^{a} 6 *ἔσται χωριστὸν κενόν*): i. e. the food will be the empty place of a body, existing independently of a body (cf. * 20^a 34 – ^{b} 2), and thus there will be a *ὕλη μεγέθους* existing in separation from actual body. But this was shown to be impossible: cf. e. g. * 20^b 17–25. But (b) if the food be an actual body, there will be two bodies—the growing thing and the food—in the same place. Yet such reciprocal interpenetration of two bodies is also impossible.

It will be observed that Aristotle here assumes that the growing thing is a *σῶμα*, i. e. through and through tangible body. In the *Physics* (213^b 18–20) he says that growth was universally

supposed to imply the real existence of a 'void', i.e. of actual gaps or 'pores' in the growing thing: for it was assumed that the food was a body, and that two bodies could not be ἅμα, i.e. could not interpenetrate.

The apparent dilemma, which is here developed with regard to the food, does in fact also apply to the *materia in qua* of growth, viz. τὸ αὐξανόμενον. That too *must* be either ἀσώματον (i.e. a body with real 'voids' or 'pores') or σῶμα (i.e. through and through tangible body): and yet it *cannot* be either. When Aristotle reformulates the problem of growth, with a view to its solution, he recognizes that this apparent dilemma applies to the growing thing: cf. 21^{b} 15, where τὸ σῶμα is clearly τὸ αὐξανόμενον.

On Aristotle's own theory, both the food and the growing thing are actual bodies. Yet there are no 'pores' (no real 'voids'): and reciprocal interpenetration of bodies is impossible. The solution lies in his conception of matter as a δύναμις τῶν ἐναντίων (cf. *Phys.* 217^{a} 21 – ^{b} 28: and see below, * 26^{b} 34—27^{a} 1). One and the same ὕλη (an actual body of a certain size and, e.g., a certain density) is capable of becoming actually bigger or smaller, denser or rarer, &c. But we must not think of a 'dense' body as one in which there are few or small 'pores', and of a 'rare' body as one with large or many gaps interspacing its corporeal particles. We must rather conceive of ὕλη as a material capable of filling space with all possible degrees of intensity, or capable of expanding and contracting without a break in its continuity. In this respect Aristotle's ὕλη resembles 'das Reale', as Kant conceives it: cf. *Kritik d. r. Vernunft*, 'Anticipationen d. Wahrnehmung'.

21^{a} 9–29. ἀλλὰ . . . τοιοῦτον. We cannot evade the apparent dilemma as regards the matter of growth, by quoting the generation of air (e.g. steam) out of water. It is true that there is an increase of volume; that the matter—viz. the water—is not incorporeal; and that yet there is no reciprocal interpenetration of two bodies. But the change is not αὔξησις in the sense here defined, for two of the three characteristic conditions are unfulfilled: (i) there is no accession of fresh material, and (ii) there is no perceptible substance persisting through the change (cf. * 20^{b} 34—21^{a} 29, * 21^{a} 2–29). The change is a φθορά of water and a γένεσις of air (cf. 19^{b} 16–18): it is not a *growth* of either, since neither persists. It might, indeed, be suggested (21^{a} 14–17) that something common to water and air—e.g.

'body'—persists, and that the increase of volume is a growth of this persisting 'body'. But no *actual* body—no *perceptible substratum* common to water and air—does persist: for *πρώτη ὕλη*, which 'persists' and is transformed in the change, is not an actual body and has no 'separate' existence. Hence the change is not a *κίνησις* at all (and therefore not a *κίνησις κατὰ ποσόν*, not *αὔξησις*), but *γένεσις καὶ φθορά*: cf. * 17ᵇ 34–35, * 19ᵇ 6—20ª 7.

21ª 18. τῷ λόγῳ. As Zabarella points out, it comes to the same thing whether we translate 'we must preserve by our *account*' or 'by our *definition*': for our account is to be the nominal definition of *αὔξησις*.

21ª 22–26. ἐν . . . μένει: cf. 19ᵇ 6—20ª 2.

21ª 27. μηδὲ ὑπομένοντος. These words rather disturb the logic. Still it would be rash to excise them, for Aristotle is not as a rule pedantically accurate.

21ª 29. τοῦτο, sc. *τὸ ὑπομένειν τὸ αὐξανόμενον*, the third characteristic condition of growth. We should rather have expected *ταῦτα*: but Aristotle is thinking of the attempt to view the generation of air from water as *αὔξησις*. The *primary* ground of the failure of this attempt is the violation of *the third* condition of growth: cf. * 21ª 9–29. It is *also* true that 'there is no accession of fresh material': but that is an inevitable consequence of the absence of a persisting *substratum*, since there is nothing to which fresh material could accede.

21ª 29 – ᵇ 10. ἀπορήσειε . . . τούτῳ. The matter of growth, as we have seen, includes the food as well as the living body. Which of these is it that grows? We speak of a man 'growing in his shin': i. e. we regard the shin (the *materia in qua*) as 'that which grows'. Is this because the shin is that to which the new material (the food) is added, and therefore that which has increased in size? But if B is added to A, both B and A have increased: so that, from that point of view, both the shin and the food have increased in size, and both have 'grown'. We should expect *τὸ αὐξανόμενον* to include both: just as, when wine is mixed with water, the volume of the mixture as a whole—i. e. the volume of both and of either of the ingredients—is greater. The real reason why the shin only (and not the food, nor both shin and food together) is said to have 'grown', is that the substance of the shin persists, whilst that of the food is transformed: and that the efficient cause of the process (i. e. the *αὐξητικὴ ψυχή*) is in the shin, but not in the food.

21ª 30. προστίθεται. It is not really *πρόσθεσις*, but more like *μίξις* (cf. ª 33, 22ª 9) : though, as we shall see, it is not (strictly speaking) *μίξις* either. Cf. * 27ᵇ 13–17.

21ª 31–32. οἷον . . . οὔ, 'e. g. if a man grows in his shin, is it the shin which is greater' and thus has 'grown', 'whilst that "whereby" he grows, viz. the food, is not greater, and has not "grown"?'

No mark of interrogation is required after *οὔ*, because the question is indirect, depending on *ἀπορήσειε δ' ἄν τις*. In ª 31 *αὐξάνει* is intransitive both times (cf. e. g. *Post. Anal.* 78ᵇ 6, *Hist. Anim.* 629ª 21), the implied subject is *ὁ ἄνθρωπος* or *τὸ ζῷον*, *τὴν κνήμην* is an 'internal' accusative, and the dative *ᾧ* (for which F wrongly gives *ὅ*) is undoubtedly right : cf. e. g. *ᾧ δ' ἠλλοίωται* (21ᵇ 5), and * 21ª 5–9.

21ª 33–34. ὁμοίως . . . ἑκάτερον. *πλεῖον* (not *μεῖζον*) shows that this clause refers to the ingredients of the *μῖγμα*. *ὁμοίως*, i. e. if the wine has increased in volume, so—on the same principle—has the water.

21ª 35 – ᵇ 2. ἐπεὶ . . . μῖγμα. Even the example, which *seemed* to show that *τὸ αὐξανόμενον* includes both the shin and the food, really confirms the true view, viz. that only the shin 'grows'. For it is the 'prevailing' ingredient only which is said to have increased in volume (ª 35 *λέγεται*, sc. *πλεῖον* : ᵇ 1 *ὅτι οἶνος*, sc. *πλείων*). If the mixture as a whole acts as wine, then wine is the 'prevailing' ingredient and *its* volume is said to have increased. So, in growth, the substance of the shin persists and prevails over the food, which is transformed. Hence the shin alone is said to have grown.

21ᵇ 2–10. ὁμοίως . . . τούτῳ. Alteration is here adduced as a parallel to growth : for *τὸ ἀλλοιούμενον* and *τὸ ᾧ ἠλλοίωται* correspond respectively to *τὸ αὐξανόμενον* and *τὸ ᾧ αὐξάνει*, and *τὸ ἀλλοιοῦν* (the efficient cause of *ἀλλοίωσις*) corresponds to *τὸ αὐξητικόν* (cf. 22ª 12).

Aristotle illustrates by an alteration of *flesh* (ᵇ 3), because he is thinking *primarily* of *ἀλλοίωσις qua* contributory to *αὔξησις* : cf. * 20ᵇ 34—21ª 29.

21ᵇ 4. τῶν καθ' αὑτό. For *τὰ καθ' αὑτὸ πάθη* in this sense, cf. * 19ᵇ 10–12, * 19ᵇ 26–27.

21ᵇ 5–6. ᾧ . . . κἀκεῖνο. *τὸ ᾧ ἠλλοίωται* is the external stimulus (cf. * 20ª 8) of alteration, corresponding to the *materia ex qua* of growth (the food). The fire, e. g., is 'that, whereby' our temperature is altered.

On the distinction here implied between (i) an 'altering agent' which is itself affected by the reaction of the patient, and (ii) an 'altering agent' which is *ἀπαθές*, see * 24ª 24 – ᵇ 22.

21ᵇ 6–10. ἀλλὰ . . . τούτῳ. The *ἀλλοίωσις* is not predicated of the 'stimulus', even though (in some alterations) the latter is itself affected. The flesh or the stomach, e. g., (not the food) is *τὸ ἀλλοιούμενον*, the proper subject of the process. For the 'altering agent' *proper* (*τὸ ἀλλοιοῦν* in the sense of the *ἀρχὴ τῆς κινήσεως* or *τὸ κινοῦν*) is 'in' the flesh or the stomach, not 'in' the food.

Similarly the food is not *τὸ αὐξανόμενον*, even if it gets larger in some instances of growth. For (a) the food's substance does not persist, and (b) 'the agent' of the growth—its efficient cause—is not 'in' the food, but 'in' the living body. For 'the agent' *proper* (*τὸ κινοῦν*) is the soul: cf. * 20ª 8, and 22ª 12 (*τὸ ἐνὸν αὐξητικόν*).

21ᵇ 9. οἷον . . . πνεῦμα. Aristotle may be thinking of the conversion of a flatulent food into wind, as Zabarella suggests. But more probably he has in mind the maintenance and growth of the *ἔμφυτον* (or *σύμφυτον*) *πνεῦμα*: cf. *de Spiritu* 481ª 1 ff.

21ᵇ 10–16. ἐπεὶ . . . αὐξάνεσθαι. In order 'to find a solution of the problem' (ᵇ 11 *τῆς ἀπορίας*, sc. the entire problem of growth), Aristotle reformulates the results of his discussion of *the process* and *the matter* of growth. In ᵇ 11 *αὐτῶν* refers to the two questions, viz. (i) what is Growing or Diminishing (21ª 1–2), and (ii) what is *τὸ αὐξανόμενον* (21ª 29–32)? These two questions are themselves only restatements of the two topics put forward at 20ª 8–10, viz. (i) how growth is *distinctively* defined, and (ii) how growth takes place: cf. * 20ª 10 — 22ª 33.

21ᵇ 14. ὅτιοῦν σημεῖον αἰσθητόν. 'Every *perceptible* particle': for a body does not consist of points.

21ᵇ 15–16. καὶ . . . αὐξάνεσθαι. Aristotle here assumes (i) that the food is a 'body', and (ii) that the growing body (ᵇ 15 *τὸ σῶμα*, i. q. *τὸ αὐξανόμενον*) has no real 'voids' or 'pores' in it: cf. * 21ª 5–9.

21ᵇ 16–17. λεπτέον . . . αἴτιον. We have formulated the 'nominal definition' of growth: for (i) we have stated *the kind* of process which growth is, and (ii) we have indicated what *τὸ αὐξανόμενον* is, i. e. the substance in which growth 'inheres' or of which it is a *πάθος*. If we can discover the adequate cause connecting growth with the substance which grows, we shall be able to construct a scientific definition, specifying (a) the substance in

which, (b) owing to a determinate cause, (c) that determinate process, which 'growth' means, must occur. Cf. Introd. §§ 8, 9: * 14ª 2–3, * 20ᵇ 34—21ª 29, * 28ᵇ 22.

What is this 'adequate cause' of growth? What corresponds in the scientific definition of growth to 'extinction of fire' and 'interposition of the earth' in the definitions of thunder and eclipse (cf. Introd., l. c.)?

On the whole, I think that Zabarella has given the right answer to this question:—see, besides his note on the present passage, his Commentary on *Post. Anal.* 94ª 20–35, and his treatise *De medio demonstrationis*, ii, especially Chapters 4–7.

The gist of the matter is as follows. Thunder and eclipse are πάθη linked to their subjects by causes 'external to' (i. e. separated in space from) those subjects. The nature of the clouds or of the moon is not *per se* (does not contain in itself) an adequate ground for the occurrence of thunder or eclipse: 'external' causes (in these instances, external 'efficient causes') are required to determine their inherence in their subjects.

But growth is linked with its subject by an 'immanent' cause, viz. by the nature or 'form' of the growing thing itself. The growing thing is an ἔμψυχον σῶμα—a body, whose 'form' is the basal soul (the ψυχὴ γεννητική or αὐξητική, cf. * 20ª 8)—and, as such, it is (i) necessarily receptive of growth, i. e. of a process fulfilling the three characteristic conditions (cf. * 20ᵇ 34—21ª 29). Such a process *can* occur in a σῶμα *qua* informed by the basal soul; and it can occur nowhere else. The 'form' of the growing thing is thus the adequate ground of *the possibility* of growth. From this point of view, the growing thing, in virtue of the basal soul which is its 'form', may be called *the material cause* of growth—in the sense which Aristotle gives to 'material cause' in *Post. Anal.* 94ª 20–35. But (ii) the same basal soul is also the (immanent) *efficient cause* of growth, though Aristotle says very little about it here from that point of view. Apparently, however, the occurrence and continuance of growth, and also its cessation and reversal (i. e. 'diminution'), are to be ascribed to the basal soul *qua efficient cause*: cf. 22ª 28–33. If that is so, then the 'form' of the growing thing is the adequate cause, not only of *the possibility*, but also of *the actual occurrence*, of growth and diminution.

If the proposed interpretation be right, the unsatisfactoriness of Aristotle's doctrine is obvious enough. He is 'explaining' growth

by referring it to the basal soul—i.e. to τὸ αὐξητικόν—as its cause. Incidentally, however, as we shall see, there are details of considerable interest in his account.

21b 17—22a 33. διορισαμένοις . . . μένει. The plan of this passage, in which Aristotle expounds his own theory of growth, is as follows :—

(i) **21b 17–22.** The cause of growth is the 'form' of the growing thing (see preceding note). Hence, if we are to grasp the cause, we must determine *precisely* what the growing thing is: and for that purpose our attention is drawn to two preliminary distinctions.

(ii) **21b 22—22a 4.** The growing thing, whether 'tissue' (ὁμοιομερές) or 'organ' (ἀνομοιομερές), grows—i.e. gets larger—*as a whole* (as form-in-matter), and does so by the accession of food. But this does not mean that food accedes to every part of *the matter* of the tissue or organ. The matter is in constant flux, always flowing in and out, and no material particle endures. We can only say that food accedes to every part of the tissue or organ *qua form* : i.e. the growth of the whole is a uniform proportional expansion of its 'figure' or 'structural plan'. The food is at first 'unlike' the growing thing: but in the process it is transformed and thus 'assimilated'.

(iii) **22a 4–16.** An attempt is made to explain more precisely how the food is related to the growing thing, what its 'assimilation' is and how it is effected.

(iv) **22a 16–28.** Growth is distinguished from nutrition: and it is explained more definitely *in what sense* (in growth) a determinate amount e.g. of flesh comes-to-be out of a food which is *only potentially* so-much-flesh.

(v) **22a 28–33.** The 'form' of the growing thing—i.e. the basal soul, which shows itself as the 'structural plan' of the matter wherein it is immersed (cf. * 21b 24–25)—is the *efficient cause* of growth and diminution.

21b 17–19. ἓν . . . ἕκαστον. *First preliminary distinction.* The growing thing is *either* a ὁμοιομερές, *or* an ἀνομοιομερές (cf. * 14a 19): but the latter grows only by the growth of its constituent ὁμοιομερῆ. The ὁμοιομερῆ here in question are the 'tissues' of plants and animals, though Aristotle illustrates only from animals.

21b 19–22. ἔπειθ' . . . ὀστοῦν. *Second preliminary distinction.* Flesh, or bone, or any tissue, is double in its nature: a fact which is indicated by linguistic usage. For these terms are

applied ambiguously, so that they mean *sometimes* the tissue *qua* matter, and *at other times* the tissue *qua* form.

A tissue (e. g. flesh), considered in abstraction from the living body to which it belongs, is simply a μιχθέν—a mere chemical compound. Its *matter* is the four 'simple bodies' (or rather the four 'elementary qualities') and its *form* is adequately expressed in their 'combining-formula' (λόγος τῆς μίξεως). Similarly an organ (e. g. the hand), considered in abstraction from the living body to which it is organic, is simply an aggregate of tissues. Its *matter* is the tissues, of which it is composed, and its *form* their 'synthesis' (cf. * 14ª 19). It is in this sense that Alexander (περὶ κράσεως καὶ αὐξήσεως, ed. Bruns, p. 235, ll. 17 ff.) interprets the distinction between *matter* and *form* of tissues and organs in the present passage.

But it is clear from what follows that Aristotle is thinking of tissues and organs *as constituents of the living organism*, i. e. as themselves 'besouled' or alive. The matter of the *living* tissue is the chemical compound, i. e. the tissue itself *qua* μιχθέν: and its form is the soul or 'life'. And the matter of the *animate* organ (the living hand, e. g.) is the synthesized tissues. Its form is the soul, which manifests itself in the organ's function (ἔργον), originating the movements and vital processes whereby the organ contributes to the maintenance of the life of the whole ἔμψυχον (cf. e. g. * 21ᵇ 28–32, *Metaph.* 1036ᵇ 28–32, 1025ᵇ 32—1026ª 6, *Meteor.* 389ᵇ 23—390ᵇ 14).

21ᵇ 24–25. δεῖ . . . γινόμενον. The primary object of this simile is to illustrate the flux of the flesh *qua matter*, and its persistence *qua form*. The *form* is the soul: but it is manifested in the matter as a 'figure', a 'structural plan' or a 'scheme of proportions', which limits or measures the matter. The use of the term μέτρον suggests the application of the illustration to growth. If we suppose the 'measure' of the flowing water to be, e. g., a bag of skin, open at both ends, inherently capable of expansion and contraction, the simile will illustrate the growth and diminution of a tissue. For a tissue—e. g. a bone or a muscle (a piece of σάρξ)—may be compared to a 'duct' (an αὐλός: cf. * 22ª 28–33; Philoponos, pp. 109, 110; Alexander, l. c., p. 237, ll. 25 ff.), capable of expansion and contraction according as the matter, which flows through it and fills it, increases and diminishes in amount. The duct, as that which limits and measures the tissue, may be regarded as its 'figure' or 'form'. But the duct is the

embodied vitality—the embodied power of expanding and contracting, growing and diminishing—which *is* the basal soul: for that soul is δύναμίς τις ἐν ὕλῃ (22^{a} 29).

The words ἀεὶ . . . γινόμενον (^{b} 25) refer, I think, to the matter of the tissue, not to the water: 'for particle after particle comes-to-be, and each successive particle is different.'

21^{b} 25–28. οὕτω . . μορίῳ. Growth is a uniform proportional expansion of the figure or structural plan of the tissue, an increase in which every part of the 'form' gets larger.

The form of the living tissue, as we know (* 21^{b} 19–22), is the soul: but the soul is essentially an εἶδος ἔνυλον, a δύναμις ἐν ὕλῃ, and it is manifested in the figure or 'scheme of proportions' which limits or 'measures' the tissue. Hence Aristotle can speak of 'an accession to each part of the form' (cf., however * 21^{b} 33–34), i. e. to each part of the *embodied* soul or *materialized* power. It is essential to the soul to animate a corporeal material, i. e. a *quantum*: and, in so far as the whole tissue is larger or smaller, its 'form' (i. e. its soul or vitality) is expanded or contracted, informing a greater or smaller *quantum*.

21^{b} 28–32. ἐπὶ . . . βραχίων. Though what grows is the *animated matter as a whole* (as a σύνολον of form and matter), its growth is a uniform expansion of structural plan—an expansion of the scheme of proportions measuring the matter, not an addition to persisting material constituents. This fact—viz. ὅτι ἀνάλογον ηὔξηται, ^{b} 29—is more manifest in the growth of the 'organs' than in that of the 'tissues', because the distinction of the *form* (the life embodied in the proportional structure, and expressed in the vital function, or ἔργον) from the *matter* is more obvious in the former than in the latter (cf. *Meteor.* 389^{b} 29—390^{b} 2). For the same reason (^{b} 31–32), conversely, there is more tendency to attribute 'flesh' and 'bone' to the corpse than 'hand' and 'arm'. In fact, what really persists for a time in the corpse is neither 'hand' and 'arm', nor 'flesh' and 'bone', but lifeless μιχθέντα (which we may mistake for 'tissues') and συνθέσεις-of-μιχθέντα bereft of the life which made them 'organs': cf. * 21^{b} 19–22.

21^{b} 33–34. κατὰ . . . οὗ. 'For there has been an accession to every part of the flesh *qua* form, but not *qua* matter'—a more accurate statement of the doctrine than that given above, ^{b} 27–28 (τοῦ δὲ σχήματος καὶ τοῦ εἴδους ὁτῳοῦν μορίῳ, sc. προσγίνεται). But the fundamental difficulties of the doctrine, it need hardly be

said, remain unsolved. *How* can the 'form'—the soul, or the embodied soul—expand? And what is meant by 'accession to every part', whether of the flesh *qua* form, or of the form itself? Aristotle attempts, in the following passage, to explain in what sense the food 'accedes'.

21^{b} 35—22^{a} 4. μεῖζον . . . ἀνομοίῳ. The acceding body (the 'food') is at first 'unlike' the growing tissue, and is called 'contrary' to it. But in the process it is 'transformed' so as to be 'assimilated', i. e. made 'like' the tissue. Expressing this in the current contemporary phraseology (cf. e. g. 23^{b} 1–15), we can say 'In one sense *Like grows by Like*, but in another sense *Unlike grows by Unlike*'.

In 22^{a} 1 EJ read *ἐναντίου*, perhaps rightly. If we adopt this reading, we must take *ὃ καλεῖται τροφή* as a parenthesis. *ἐναντίον*, i. q. *ἀνόμοιον*: cf. *de Anima* 416^{a} 29–34.

22^{a} 4–16. ἀπορήσειε . . . γένεσις. Aristotle restates—in his own terminology, and more fully—his doctrine concerning the food.

The food is *at first* only potentially the tissue, actually a different body: actually e. g. bread, only potentially flesh. 'Assimilation' is transformation, the passing-away of the bread and the coming-to-be of flesh. But it is a 'transformation' with two peculiar features: for (i) it presupposes that the food and the tissue have been 'mixed together', so as to be contained within one and the same immediately-continent place, and (ii) the agent of the transformation is not in the food (the food is not *of itself* transformed into flesh), but in the tissue. The *αὐξητικόν*, immanent in the tissue, converts the food into flesh.

22^{a} 6–10. φθαρὲν . . . μιχθέν; 'This actual other, then, viz. the food, has passed-away and come-to-be flesh. But it has not been transformed into flesh alone by itself (for that would have been a *coming-to-be*, not a *growth*): on the contrary, it is the growing thing which has come-to-be flesh [and grown] *by* the food. In what way, then, has the food been modified by the growing thing so as to be transformed into flesh? Perhaps we should say that it has been mixed with the growing thing, as if one were to pour water into wine, and the wine were able to convert the new ingredient into wine.'

The subject of *παθόν* in ^{a}8 is not *τὸ αὐξανόμενον*, but *τὸ ᾧ αὐξάνεται*, i. e. the food: for (i) it is more natural to suggest that the food is 'mixed' with the tissue, than *vice versa*, (ii) the whole

problem concerns the food (cf. a 4–5 *ἀπορήσειε . . . αὐξάνεται*), and (iii) *ὑπὸ τούτου* (a 8–9) ought to mean 'by the agency of this, i. e. the growing thing', and not simply 'by this', i. e. 'by the food' as *τὸ ᾧ αὐξάνεται*. But if so, then *ηὐξήθη* (a 9) is impossible. We may either (i) reject *ηὐξήθη* as a misplaced and mistaken marginal gloss on *ἀλλὰ τὸ αὐξανόμενον τούτῳ* (a 8), or (ii) accept it as genuine, and read it after *τούτῳ* (a 8), or (iii) correct it into *ηὔξησεν* (cf. Φc). (i) The excision of *ηὐξήθη* is the simplest remedy. We should then have to supply in thought *σὰρξ γέγονεν* (a 7) as the verb, of which *τοῦτο* (a 7), *τὸ αὐξανόμενον* (a 8), and the substantive implied by *παθόν* (a 8) are the subjects. (ii) If we read *ηὐξήθη* after *τούτῳ* (a 8), we must regard it as an equivalent, but more natural, expression for *σὰρξ γέγονεν*. If flesh grows, more flesh comes-to-be: but it is more natural to say 'the growing-thing—i. e. the flesh—has grown', than to say, 'the growing-thing has come-to-be flesh'. We must still supply *σὰρξ γέγονεν* as the verb for *τοῦτο* in a 7, and for *παθόν* in a 8. (iii) The chief objection to *ηὔξησεν* is that it is so obvious a correction.

22a 9. μιχθέν. It is not, strictly speaking, a case of *μίξις*: cf. * 27b 13–17.

22a 9–10. ὁ . . . μιχθέν; ὁ δέ, sc. ὁ δὲ οἶνος. *τὸ μιχθέν* according to Aristotle's usual terminology means *the compound* which results from combining two or more ingredients. But, in view of a 9 (*ἢ μιχθέν*), it should probably be interpreted here as the new *ingredient*, i. e. the water.

22a 10–13. καὶ . . . σάρκα. Fire lays hold of the inflammable material and converts it into fire. Similarly the *αὐξητικόν*, immanent in the flesh, lays hold of the food (which is potentially flesh) and converts it into actual flesh. It *consumes* the food, as the fire *consumes* the wood. The comparison is specially appropriate, owing to the part played by *τὸ σύμφυτον θερμόν* in digesting, and thus assimilating, the food: cf. * 20a 8, * 20b 34—21a 29, * 29b 24–26.

The unexpressed main verb, of which *τὸ πῦρ* (a 10) is the subject, is *ἐποίησεν ἐντελεχείᾳ πῦρ*: and *προσελθόντος δυνάμει σαρκός* (a 12–13) is the object of an unexpressed *ἁψάμενον*. It would be easier, no doubt, if Aristotle had written ⟨*τοῦ*⟩ *προσελθόντος* ⟨*καὶ*⟩ *δυνάμει σαρκός*.

22a 13. οὐκοῦν ἅμα ὄντος, sc. *ἁψάμενον τὸ αὐξητικὸν ἐποίησεν ἐντελεχείᾳ σάρκα*. For the meaning of *ἅμα*, cf. * 16b 4.

22ª 15. αὔξησις. This is not *αὔξησις* in the sense given to the term in the present chapter: cf. * 20ᵇ 34—21ª 29. It is, however, analogous to growth, because—as Zabarella expresses it—'ignis ex propria et insita virtute convertit combustibilia in se ipsum'.

22ª 16–20. ποσὸν . . . ποσῆς. The food is an actual body of a certain size, e. g. a piece of bread of such and such cubic content. This actual body is potentially another actual body (the bread is potentially flesh), and its actual size is potentially a different size. Hence what comes-to-be in growth is not *quantum-in-general* out of the mere potentiality of *quantum*, but a tissue or an organ of a determinate size out of (by the accession of) e. g. a piece of bread of a (different) determinate size.

A similar principle holds in *γένεσις*. What comes-to-be is not *animal-in-general*, but such-and-such a specifically determinate animal (in ª 17 we should probably read *μήτε τι τῶν* with $H\Phi^1\Gamma$).

Philoponos points out that the parallel, as Aristotle here states it, breaks down if pressed. For man, e. g., comes-to-be out of a matter which is not an 'animal', whereas a piece of flesh of such-and-such a size does not come-to-be in growth out of a matter devoid of magnitude. But Aristotle is thinking primarily of the *resultant*, and not of the *matter*: otherwise he could have made the parallel exact. For just as the food, out of which the new *quantum* comes-to-be, is itself an actual *quantum*; so the matter, out of which the new body comes-to-be, is itself an actual body (cf. * 20ᵇ 16–17).

22ª 19. σὰρξ . . . ὁμοιομερῆ. 'But what does come-to-be in growth is a *something-quantified*—so-much flesh or bone; or a hand or arm of such-and-such a size, i.e. the quantified tissues of these organic parts.'

I have added *ἢ βραχίων* after *χείρ* by conjecture: cf. 21ᵇ 32. Dᵇ reads *ἢ χεὶρ ἢ νεῦρα*. But *νεῦρον* is a *ὁμοιομερές* (cf. e. g. *Meteor.* 385ª 8), and we want a second *ἀνομοιομερές* to justify the plural *τούτων*.

22ª 20–28. ᾗ . . . τροφή. Cf. *de Anima* 416ª 19 – ᵇ 31.

22ª 20–22. ᾗ . . . σάρκα. 'In so far as this acceding food is *potentially* the double result—e. g. is *potentially* so-much flesh—it produces growth: for it is bound to become *actually* both *so-much* and *flesh*' (cf. 22ª 26–28). *τὸ συναμφότερον* is the predicate. It means 'that which combines both the new substance and the new quantity'.

22ª 24. καὶ φθῖνον. Nutrition continues through life: whether

there is growth (or diminution) as well, depends upon whether the living thing is able to assimilate more (or only less) food than is required to repair the waste of its tissues.

22ª 25–26. καὶ . . . ἄλλο. Cf. * 19ᵇ 3–4. The same difference is expressed above (ª 23–24) in the words ταύτῃ . . . τῷ λόγῳ: for the definitions of nutrition and growth state what τὸ τροφῇ εἶναι and τὸ αὐξήσει εἶναι respectively are.

22ª 28. τροφή, i. e. 'nourishment', 'food *qua* nutritive': not (as e. g. at ª 25) 'nutrition'.

22ª 28–33. τοῦτο . . . μένει. 'As to this form' (the 'form' which grows in every part of itself, cf. 21ᵇ 22–34), 'it is a kind of power immersed in matter—a duct, as it were. If, then, a matter accedes—a matter, which is potentially a duct and also potentially possesses determinate quantity—the ducts to which such matter accedes will become bigger. But if this form or power is no longer able to act—if it has been weakened by the continued influx of matter, just as water, continually mixed in greater and greater quantity with wine, in the end makes the wine watery and converts it into water—then it will cause a diminution of the *quantum* of the tissue in which it is; though still the form persists.'

All the manuscripts, Bekker, and Prantl read ἄϋλος, ἄϋλοι. But ἄϋλος does not occur elsewhere in Aristotle, makes nonsense of the passage, and leaves οὗτοι (ª 30) without an antecedent. After ἐστίν (ª 29) J has, in the first hand, ὁμοίως δὲ καὶ ἄλλο ὅ τι οὖν ὄργανον, and the same words are implied in Γ and Vatablus. Moreover, Vatablus renders ἄϋλος, ἄϋλοι by 'tibia', 'tibiae'. Clearly, then, there was a reading αὐλός, αὐλοί.

I have excised ἄνευ ὕλης (ª 28) as a marginal note intended to explain or correct the un-Aristotelian ἄϋλος: and I regard the additional clause in J, Γ, and Vatablus as a marginal note intended to explain the variant αὐλός—the annotator having misinterpreted αὐλός as 'flute', i. e. the stock Aristotelian example of an ὄργανον (cf. e. g. *Meteor.* 389ᵇ 31—390ª 2).

Aristotle uses αὐλός for various kinds of 'ducts' or 'channels' in an animal's body: cf. Bonitz, *Ind.* 122ª 26 ff. My conviction that Aristotle wrote αὐλός, αὐλοί here (in the sense of 'duct') is confirmed by 21ᵇ 24–28 (see * 21ᵇ 24–25). It is noticeable also that Philoponos, although he reads ἄϋλος, ἄϋλοι here, in a previous note (pp. 109, l. 26—110, l. 7) illustrates growth by αὐλοειδὴς κηρός, uses αὐλός in the sense of a 'duct' or 'channel', and speaks of τὰ αὐλοειδῆ ὀστᾶ.

22ª 31–33. ἐὰν . . . μένει. The 'form' is the embodied ψυχὴ αὐξητική, the δύναμις αὐξητική which is essentially immersed in matter: cf. * 21ᵇ 25–28. As the animal grows old, this 'power' —the efficient cause of nutrition and growth—becomes weaker, i. e. unable to assimilate sufficient food to balance the waste of the tissues (cf. * 22ª 24). Aristotle compares this enfeeblement of the αὐξητικόν to the weakening of wine, when more and more water is mixed with it. But the parallel is not exact: for the 'form' of the tissue remains (ª 33), whereas the wine is ultimately converted into water (ª 32).

Aristotle's meaning is clear: but the illustration (ª 31–32 ἀλλ' . . . καὶ ὕδωρ) is rather loosely attached to the main sentence. *What has to be illustrated* is the decay of the power embodied in the tissue: but *what is expressed in the illustration* is the action of the water in weakening the wine.

A. 6

22ᵇ 1–26. Ἐπεὶ . . . ποίησις. Aristotle has completed the first part of his task. He has given the 'nominal definitions' of γένεσις and φθορά, of ἀλλοίωσις and of αὔξησις, thus distinguishing these changes from one another: and he has shown that γένεσις and φθορά actually occur. He now prepares to attack the second part of his task, viz. the discovery of the causes of γένεσις and φθορά (cf. e. g. * 14ª 2–3, * 17ª 32—19ᵇ 5, * 20ᵇ 34—21ª 29).

He selects as *first* for treatment 'the matter', the material constituents out of which the composite natural bodies come-to-be and into which they pass-away. These material constituents are, as we shall learn later, 'the simple natural bodies'—Earth, Air, Fire, and Water. For *in the last resort* every γένεσις of a composite natural body is the coming-to-be of one or more new ὁμοιομερῆ, and every φθορά of a composite body is the disappearance of one or more existing ὁμοιομερῆ. And every ὁμοιομερές is a chemical compound whose constituents are Earth, Air, Fire, and Water (cf. * 14ª 19).

The first eight chapters of the second book—a section of the work to which Aristotle refers (*de Anima* 423ᵇ 29; *de Sensu* 441ᵇ 12) as τὰ περὶ στοιχείων—are devoted to the consideration of these material constituents of the ὁμοιομερῆ. But these material constituents—'the so-called elements'—constitute the ὁμοιομερῆ by *chemical combination* (μίξις): 'combination' implies *action and passion* (ποιεῖν καὶ πάσχειν, ποίησις): and both μίξις and ποίησις

imply *physical contact* (ἁφὴ ἡ ἐν τοῖς φυσικοῖς). Hence Aristotle explains ἁφή (22ᵇ 26—23ª 34), ποιεῖν καὶ πάσχειν (23ᵇ 1—27ª 29), and μίξις (27ª 30—28ᵇ 22), as a necessary preliminary to his treatment of the material constituents of the ὁμοιομερῆ (cf. also Introd. § 12).

22ᵇ 1–2. Ἐπεὶ . . . εἰπεῖν. In discussing the causes of coming-to-be 'we must first investigate the *matter*, i.e. the so-called elements' . . . Zabarella is, I think, right in taking πρῶτον to refer to the order in which Aristotle proposes to investigate the causes of γένεσις and φθορά. We are to begin with *the material cause*, i.e. 'the matter' in the sense of those material constituents of the ὁμοιομερῆ which are generally called 'the elements'.

The words καὶ τῶν καλουμένων στοιχείων are explanatory of τῆς ὕλης. Aristotle has already treated of the ὕλη of γένεσις and φθορά in the sense of πρώτη ὕλη (cf. A. 3, and e.g. * 17ª 32—19ᵇ 5): he is now to treat of the ὕλη in a different sense. He is not now concerned with that *conditio sine qua non* of unqualified γένεσις and φθορά which ultimate analysis forces us to 'isolate by definition' (cf. * 20ᵇ 17–25), but with *the actually-existent antecedents* of γένεσις—the proximate materials out of which the ὁμοιομερῆ come-to-be and into which they pass-away. These are themselves 'bodies', perceptible things, viz. Earth, Air, Fire, and Water. According to Aristotle's own doctrine, they are 'simple' or elementary *bodies* (τὰ ἁπλᾶ σώματα), i.e. they cannot be dissolved into any more primitive corporeal constituents. But they presuppose (logically, though not temporally) more primitive 'constitutive moments': for they are informations of πρώτη ὕλη, explicable in terms of πρώτη ὕλη and 'the contrary qualities' (Hot, Cold, Dry, Moist). Aristotle prefers to reserve the term στοιχεῖα for the absolutely underivative and unanalysable immanent ἀρχαί of 'body', viz. πρώτη ὕλη and the ἕξις and στέρησις which are its primary 'constitutive moments': cf. e.g. *Metaph.* 1070ᵇ 22–30, * 29ª 5. Hence here and elsewhere (cf. Bonitz, *Ind.* 702ᵇ 2–7) he refers to the simple bodies as τὰ καλούμενα στοιχεῖα, the commonly so-called 'elements' (cf. e.g. 28ᵇ 31, * 29ª 24 – ᵇ 3; and see Diels, *Elementum*, p. 25₅).

22ᵇ 2–3. εἶτ' . . . γίγνεταί πως. This is the first of two questions (to be discussed in the second book) concerning the material constituents of the ὁμοιομερῆ. 'Are they really στοιχεῖα (as they are commonly called) or not? In other words, are they eternal or is there a sense in which they come-to-be?'

The words καὶ . . . γίγνεταί πως are explanatory of εἴτ' ἐστὶν εἴτε μή. The question is not whether Earth, Air, Fire, and Water *exist*, but whether they are στοιχεῖα, i.e. primary and underivative constituents of things. If they are στοιχεῖα, they must be ἀΐδια, as e.g. Empedokles maintained (cf. * 15ª 4–8).

It will be convenient at this point to restate Aristotle's doctrine of the simple bodies as constituting the physical universe. In rough outline, as the reader will remember (cf. Introd. § 10), that doctrine is as follows:—The physical universe is divided into the Upper Cosmos or heavens, and the Lower Cosmos or sublunary world. The Upper Cosmos consists entirely of the Aether. The Lower Cosmos is a series of concentric spherical *strata*. The lowest of these *strata*—the central region both of the sublunary world and of the whole universe—is Earth. The next *stratum*, immediately surrounding Earth, is Water. Air immediately envelops Water: and the uppermost *stratum*, immediately surrounding Air, is Fire.

This rough outline must now be supplemented and corrected. For though it is an accurate summary of Aristotle's doctrine as that is stated in many passages, it totally neglects another most important side of his teaching: and, by that omission, it suggests the erroneous view that the physical universe, as he conceives it, is a static arrangement of quiescent *strata*.

(i) Not much need at present be said with regard to the Upper Cosmos (see, for a fuller account, e.g. * 36ª 14 – ᵇ 10). The Aether, which constitutes it, is anything but quiescent: on the contrary, it is eternally-revolving. But there is no interchange between the Aether and the simple bodies of the Lower Cosmos. The Aether is in no sense identical with, or kin to, Earth, Air, Fire, and Water. Hence there can be no ποιεῖν καὶ πάσχειν, and therefore no reciprocal contact, between the two worlds. Yet Aristotle maintains that there is a *one-sided* connexion. For the lowest sphere of the heavens is conterminous with the uppermost *stratum* of the sublunary world. Hence the Upper Cosmos 'touches' and 'moves' and 'steers' (cf. *Meteor.* 339ª 21–24) the Lower, without itself being 'touched' or moved or in any way affected by the latter (cf. * 22ᵇ 32—23ª 34, * 23ª 12–22, * 23ª 25–33).

But (ii) as regards the Lower Cosmos, we must recognize not only that each *stratum* is far from quiescent, but also that all four simple bodies are in constant process of reciprocal transformation. It is thus somewhat dangerous to speak of *strata* at all. It is

true, no doubt, that each of the four bodies tends to move towards, and to stay in, its own proper region: but there is a continuous interchange of matter from region to region. The sublunary world, we must remember, is the proper sphere of *γένεσις* and *φθορά*. The four simple bodies are for ever coming-to-be out of, and passing-away into, one another: and it is primarily in virtue of this unbroken cycle of reciprocal transformations that they constitute and maintain the structure of the sublunary world.

A full account of Aristotle's theory would involve a close examination of his statements concerning 'the twofold exhalation' (*διπλῆ ἀναθυμίασις*), which plays a central part in the interchanges of the simple bodies constituting the Lower Cosmos (cf. *Meteor.* e. g. 341^{b} 5 ff., with Alexander's commentary: Gilbert, e. g. pp. 460 ff.). But, for our present purpose, the following brief indications must suffice. The earth, owing to the heat of the sun, gives off a twofold exhalation, which is partly *hot–moist* and partly *hot–dry*. The *hot–moist* exhalation (*ἀτμίς, ἀτμιδώδης ἀναθυμίασις*) is drawn from the water on the surface of the earth. It is—Aristotle says in one passage (*Meteor.* 360^{a} 21–27)—'in its own nature cold, like water before it has been heated': and it retains a watery character throughout (it is *δυνάμει οἷον ὕδωρ*). We must conceive it as a kind of mist or aqueous vapour: water in process of transition to air, or air still capable of reverting to water. The simple body, which Aristotle usually calls 'air', is a hot–moist body, formed in part from the moisture in the *ἀτμίς* and in part from the heat in the other exhalation (cf. * 31^{a} 24). This other exhalation (*πνευματώδης* or *καπνώδης ἀναθυμίασις*, or sometimes *par excellence* *ἀναθυμίασις* simply) is a *hot–dry vapour* drawn by the sun 'from the earth itself', and not from the water on the earth's surface. (On this puzzling exhalation, see Gilbert, pp. 465 ff.) Aristotle speaks of it as *δυνάμει οἷον πῦρ*, and conceives it as rising above the *ἀτμίς* owing to its greater lightness. Hence above the 'air'—i. e. above the region where the *ἀτμίς* predominates, and where clouds are formed—there comes-to-be a simple body, which Aristotle usually calls 'fire'. In reality it is a hot–dry body, constituted by the *πνευματώδης ἀναθυμίασις*. It is a highly-inflammable stuff (*οἷον ὑπέκκαυμα*), of which fire proper is an intensification: cf. *Meteor.* 340^{b} 21–23, * 30^{b} 25–30, * 31^{b} 24–26. Aristotle explains 'shooting stars' and 'meteors' (and even the light and heat of the stars and planets, cf. Introd. p. xxxv$_{1}$), as the bursting into flame of parts of this combustible stuff, owing

to the friction produced in it by the movement of the conterminous sphere of the aetherial Cosmos (cf. *Meteor.* 341^{b} 1 ff.).

22^{b} 3–4. καὶ . . . ἐστιν. This is the second of the questions (to be discussed in the second book) concerning Earth, Air, Fire, and Water. Aristotle's own view is that 'they all come-to-be in the same manner, reciprocally out of one another'; though he thinks that there is a certain cyclical order in which their transformation is most easily and naturally effected. But various philosophers had selected one or other of these four bodies as primary and eternal, i. e. as the original stuff out of which everything else came-to-be and into which everything else passed-away. Thus, e.g., Thales had selected 'Water', Anaximenes and Diogenes of Apollonia 'Air', and Herakleitos 'Fire'.

22^{b} 6–9. πάντες . . . σαφῶς. All the *pluralist* philosophers—viz. (a) those who (like Anaxagoras, Leukippos, Demokritos, and Plato) regard Earth, Air, Fire, and Water as derivative, and trace them (as well as the composite bodies) to prior 'reals' as their constituents, and (b) those who (like Empedokles) regard Earth, Air, Fire, and Water as genuine 'elements', i. e. as underivative, and derive the composite bodies from them—employ, in their 'derivations', *association* and *dissociation*, and *action* and *passion*. And by 'association' they mean *combination*.

(Cf. 29^{a} 1–5. For Empedokles, cf. 14^{b} 7–8, 15^{a} 23–25; for Anaxagoras, * 14^{a} 13–15, 14^{a} 24 – ^{b} 1; for Leukippos and Demokritos, * 14^{a} 21–24, 15^{b} 6–15, * 15^{b} 33—16^{a} 2; for Plato, * 15^{a} 29–33, 15^{b} 28—16^{a} 4.)

22^{b} 9–11. ἀλλὰ . . . πάσχοντος. 'But, again, there cannot be Altering, any more than there can be Dissociating and Associating, without an Agent and a Patient.'

Aristotle has just shown that all pluralist philosophies must employ *combination* and *action–passion*. He had also argued (cf. * 14^{a} 6 – ^{b} 8) that all monistic theories must identify γένεσις with ἀλλοίωσις. He now maintains that ἀλλοίωσις necessarily involves action–passion, so that the monists (as well as the pluralists) must employ action–passion.

22^{b} 12. καὶ τοῖς, sc. γεννῶσιν. The emphasis is on this clause: for Aristotle's point is that the monists, no less than the pluralists, are forced to employ ποίησις, i. e. ποιεῖν καὶ πάσχειν. The variant καίτοι is a stupid correction due to misunderstanding.

22^{b} 13–21. καὶ . . . ἐστίν. Diogenes of Apollonia (cf. fr. 2; Diels, p. 334) argued that 'all things are derived from one, because

otherwise reciprocal action-passion could not have occurred'. In this he was so far right, that all things *between which reciprocal action-passion occurs* must be derived from one: but he was wrong in supposing that *all* things are transformations of a single *substratum* (b 20 τοιαῦτα). Between the οὐρανός and the things of the Lower Cosmos, e.g., there is no reciprocal action-passion.

22b 18–19. ἀνάγκη . . . φύσιν: 'that which underlies them must be a single something.' For this use of φύσις, cf. *Phys.* 191a 8, Bonitz, *Ind.* 838a 8 ff.

22b 25. πρῶτον. Philoponos takes πρῶτον with ἁψάμενα, but the aorist alone is sufficient. Perhaps the meaning is 'things cannot combine *at all*—combination is utterly impossible—unless they have come into a certain kind of contact'.

22b 28. τούτοις, sc. ἀνάγκη εἶναι ἀλλήλων ἁπτικοῖς.

22b 29. διὸ . . . ἁφῆς. According to the definition of *contact* in the *Physics* (cf. 226b 23, 231a 18 ff.; * 16b 4), which is presupposed throughout the present passage, there is *contact* when the 'extremes' of any two things are 'together', viz. are in the same immediately-continent place.

But *contact* thus defined is manifested by τὰ μαθηματικά as well as by τὰ φυσικά: the things, whose extremes are together, need not be 'perceptible bodies', but might equally well be mathematical solids, surfaces, or lines.

Hence, since Aristotle's object *here* is to determine the conditions of contact between φυσικὰ σώματα (cf. 23a 34 ἁφῆς τῆς ἐν τοῖς φυσικοῖς), the definition of the *Physics* requires further specification: see * 22b 32—23a 34.

22b 29–32. σχεδὸν . . . ἁφῆς. 'Now every term which possesses a variety of meanings includes those various meanings *either* owing to a mere coincidence of language, *or* owing to a real order of derivation in the different things to which it is applied. This may be taken to hold of Contact as of all such terms.'

Aristotle assumes that ἁφή is a term with many meanings, and urges that therefore (like all such terms) it includes its many meanings *either* (1) by a mere linguistic accident *or* (2) because of a real affiliation, viz. because the different *things meant* all derive from, or all contribute to, one and the same primary *thing meant.*

The stress is on ὥσπερ (b 30), which is answered by οὕτως . . .

ἁφῆς (^{b} 32): and the precise meaning of ὥσπερ is explained in the clause καὶ . . . προτέρων (^{b} 31–32). In other words, the correspondence between ἁφή and every other term with many meanings lies *in the manner* in which the term possesses its variety of significance, viz. that the variety must be connected in one of two different ways.

For the well-known Aristotelian distinction between (i) τὰ καθ' ἓν λεγόμενα (i. e. τὰ συνώνυμα) and (ii) τὰ πολλαχῶς λεγόμενα, including (a) τὰ ὁμωνύμως λεγόμενα and (b) τὰ πρὸς ἓν καὶ μίαν τινὰ φύσιν λεγόμενα (or τὰ ἀφ' ἑνὸς λεγόμενα), cf. e. g. *Metaph.* 1003^{a} 33 – ^{b} 19, 1004^{a} 21–31, *Eth. Nic.* 1096^{b} 26–29.

As a rule it is not the *terms*, but the different *things* denoted by the terms, which are said λέγεσθαι συνωνύμως, or λέγεσθαι πολλαχῶς (ὁμωνύμως, or πρὸς ἓν καὶ ἀφ' ἑνός). But, if the text of the present passage is right, τὰ μέν and τὰ δέ (^{b} 31) must mean 'some of the ὀνόματα', 'others of the ὀνόματα'. And, if so, it is strange that Aristotle should not have expressly stated that *some* of these ὀνόματα with many meanings fall under both headings. That is the case, e. g., with ἁφή. For (i) it is a mere accident of language that ἅπτεσθαι is applied to 'the man who grieves us' (cf. 23^{a} 32–33) as well as to 'two bodies, the extremes of which are together'. On the other hand (ii) the different meanings of ἅπτεσθαι as applied (a) to τὰ γεωμετρικά, (b) to the physical bodies in the sublunary world, and (c) to the οὐρανός in its relation to the uppermost *stratum* of the Lower Cosmos, have a genuine logical affiliation.

For the idiomatic use of σχεδόν in ^{b} 29 ('modeste affirmantis, cf. ἴσως'), see Bonitz, *Ind.* s. v. The concessive μὲν οὖν is answered by ὅμως δέ (^{b} 32).

22^{b} 32—23^{a} 34. ὅμως . . . τρόπον. Contact in the strict sense, from which all its other senses (except those due to a mere linguistic coincidence) derive, applies only to 'things which have position'. But in order to 'have position' a thing must be 'in place', i. e. must be a body with magnitude. And a body which is 'in place' must be heavy or light. Finally, bodies, which are heavy or light, are παθητικὰ καὶ ποιητικά. Hence the full definition of *contact*, in the strict and primary sense, restricts the term to *reciprocal contact* of φυσικὰ σώματα: things which 'touch', in the strictest sense, must be such that 'they are able to move, and be moved by, one another so that there is action–passion between them' (cf. * 23^{a} 22–25).

But (i) there is *contact*, in a wider and less strict sense, which is not reciprocal. Thus the οὐρανός moves the Lower Cosmos, and the latter is moved by it. But this moving and being-moved are not reciprocal action–passion : i. e. the οὐρανός is not moved by the Lower Cosmos, nor does the latter move it (cf. * 23^a 12–22). Hence, though the οὐρανός 'touches' the Lower Cosmos (since the remaining conditions of *contact* are fulfilled), the ἁφή is not reciprocal. And (ii) we apply the term 'contact' in a still looser and more derivative sense to τὰ μαθηματικά (geometrical solids, surfaces, and lines). It is not *really* τὰ μαθηματικά *as such*—not the mathematical *abstracta*—which 'touch' : for they are not 'in place'. They are only 'in place' *qua* inseparable characters of the φυσικὰ σώματα : and it is only so far—only in virtue of the bodies to which they are adjectival—that they can be said to 'touch' (cf. * 20^a 34 – ^{b} 2, * 20^b 3–5, * 20^b 14–16).

22^b 33—23^a 3. θέσις . . . τρόπον. Aristotle here (and below, 23^a 6) restricts θέσις to the things which are 'in place', i. e. to κινητὰ σώματα. Yet θέσις is attributed to the μαθηματικά (e. g. to the point, cf. * 20^a 34 – ^{b} 2), and they are said to 'touch'. Hence Aristotle finds it necessary to dispose of this apparent exception to his doctrine that only things, which are 'in place', can 'have position' and 'touch'. Now Aristotle believed that there were in the physical Cosmos a real, or absolute, 'Above' and 'Below' : and that e. g. each of the four simple bodies had its 'proper place' and its absolute position in the sublunary world (cf. Introd. § 10, * 22^b 2–3, * 23^a 6–8). The θέσις, of which he is here speaking, is absolute position—i. e. position relative to the real 'Above' and 'Below' (cf. 23^a 6–8). And, *in this sense*, only things which are 'in place'—only the φυσικὰ σώματα—can have 'position'.

In what sense, then, can the mathematical things be said to 'have position' and to 'touch'? (i) As we saw in the preceding note, the quantitative determinations of things *exist* as adjectives of φυσικὰ σώματα which are 'in place', 'have position', and 'touch' : and they may be regarded as sharing in the θέσις and ἁφή, which primarily belong to the φυσικὰ σώματα, in so far as they share also in their τόπος. But (ii) the *isolated* quantitative determinations—the *abstracta* which are τὰ μαθηματικά proper, the objects of mathematical science—have a position relative to us who conceive them, so that we distinguish e. g. the 'right' and 'left' of a figure (cf. *Phys.* 208^b 22–25). They are located by

the mathematician's conception in an *imaginary* place: and in that place they are assigned 'positions' relative to one another, and are capable of 'contact'. Thus, when θέσις is attributed to the abstract mathematical entities, 'place' is also attributed to them—not indeed the real place which contains the φυσικὰ σώματα, but an imaginary extension. For even the abstract geometrical figures involve an ideal or imaginary extension (τὸ συνεχές) as their matter (νοητὴ ὕλη). *This* geometrical circle, e. g., which cuts *that*, is a σύνολον: it is the form of circle (circularity) informing *this*, as distinguished from *that*, area or piece of τὸ συνεχές. Cf. e. g. *Metaph.* 1036ª 2–12, 1036ᵇ 32—1037ª 5.

23ª 2–3. εἶτ' . . . τρόπον. The mathematical things can be said to *touch* only in the sense in which they can be said to be *in place*. This applies, whether they have an independent existence (as e. g. Plato wrongly supposed), or whether they 'are' in some other fashion (e. g. as inseparable adjectives of the φυσικὰ σώματα, or as abstracted objects of thought).

For κεχωρισμένον (*here* equivalent to 'separate from perceptible body'), cf. e. g. * 20ª 31–34. Zabarella, however, perhaps rightly supposes Aristotle to mean 'whether by τὰ μαθηματικά we understand *the abstracted forms* of which the mathematician treats, or the quantitative characters of the perceptible things'.

23ª 3. πρότερον. The reference is to the *Physics*: cf. * 22ᵇ 29.

23ª 5. διῃρημένα. The manuscripts and Philoponos all read διωρισμένα. It is true that ποσὸν διωρισμένον is contrasted with ποσὸν συνεχές (*Cat.* 4ᵇ 20–25): but it is clear from the context that the antithesis *there* is between Discrete Quanta (e. g. Number) and Continuous Quanta (e. g. Figure). The term διωρισμένον does not appear to be used in the sense here required, viz. to mark the distinction between two separate, but contiguous, μεγέθη and a single continuous μέγεθος. It would no doubt be possible to defend διωρισμένα by passages like *de Caelo* 275ᵇ 30 (διωρισμένα τῷ κενῷ) and *Phys.* 213ᵇ 24 (τὸ κενόν, ὃ διορίζει τὰς φύσεις): but in view of 23ª 11 I have ventured to read διῃρημένα here.

23ª 6–8. τόπου . . . ἀντικειμένων. The primary differentiation of place (πρώτη διαφορὰ τόπου) distinguishes it into (a) *the Above* (the periphery of the Lower Cosmos)—the region of the absolutely light body, 'Fire': (b) *the Below* (the centre)—the region of the absolutely heavy body, Earth: (c) *the relatively Upper and Lower* (τὰ τοιαῦτα τῶν ἀντικειμένων)—the regions of the relatively light

and relatively heavy bodies, Air and Water. Cf. *de Caelo* 308ª 14–33, 311ª 15 ff. : Introd. § 10, * 22ᵇ 2–3.

But in some passages (cf. *de Caelo* 284ᵇ 6—286ª 2 ; *de Anim. Incessu* 704ᵇ 12–22, 705ª 26 ff.) Aristotle develops a more elaborate doctrine with regard to the dimensions of 'place' and the distinctions of place within the Cosmos :—

(i) In any body regarded as filling a place, or in the place containing any body, we must distinguish three dimensions, Length, Breadth, and Depth. Each dimension is the interval between a pair of opposites, viz. Above and Below (Top and Bottom), Before and Behind (Front and Back), Right and Left. One opposite in each pair is the 'origin' (*ἀρχή*) of the dimension in question, and is therefore 'prior' to the other: thus Above is prior to Below, Before prior to Behind, and Right prior to Left. And since length is the most fundamental of the three dimensions (for line can be conceived in abstraction from surface and solid, but not *vice versa*), the differentiation of place into Above and Below is the *πρώτη διαφορὰ τόπου*.

(ii) We may call this the *schematic* significance of the differentiation of place. But Aristotle thinks that the ground of these differences in place lies in the *κινήσεις* of living bodies: i. e. he maintains that their primary significance is *functional*. In all living things, *the Above* is that part of the body whence the food is distributed, i. e. whence *αὔξησις* originates. In animals, therefore, 'the top' is the head or mouth : in plants, it is the roots. In animals, *the Before* is the region upon which their *αἴσθησις* is directed (that which is *in front of* them), or that part of the animal's body whence its *αἴσθησις* proceeds (the *front* of the animal). And in animals which move from place to place, *the Right* (as Aristotle labours not very successfully to prove) is that part of the animal's body from which its locomotion originates. Since all living things exhibit *αὔξησις*, whilst only some perceive and move, the distinction of Above and Below, in this *functional* as well as in the *schematic* sense, is the primary differentiation of the three.

(iii) Now the *οὐρανός*—the physical universe—is *ἔμψυχος καὶ ἔχει κινήσεως ἀρχήν* (*de Caelo* 285ª 29–30). Hence we must ascribe to it an Above and Below, and a Right and Left, in the *functional* sense—as indeed Aristotle attempts to do. He identifies the South Pole with the *Above*, the North Pole with the *Below*, the East with the *Right*, and the West with the *Left* (cf. Heath,

pp. 231–2). It is clear, however, that the intended analogy with the animals breaks down. For (a) the differentiation into Above and Below is, in the *οὐρανός*, connected with its circular movement, whereas in the animals it was connected with *αὔξησις*: and (b) the differentiation into Front and Back disappears altogether, for an obvious reason. For if we attributed *αἴσθησις* to the *οὐρανός*, we should have to say of it, as Xenophanes said of his *θεός*, *οὖλος ὁρᾷ, οὖλος δὲ νοεῖ, οὖλος δέ τ' ἀκούει.*

23ª 9. *ἢ ἄμφω ἢ θάτερον.* If A and B are in reciprocal contact, *either* A must be heavy and B light, or A light and B heavy (*ἢ ἄμφω*); *or* A and B must both be heavy, or both be light (*ἢ θάτερον*).

Or perhaps we should interpret this as applying to the different *ἀλλήλων ἁπτόμενα* severally. For of these Earth is absolutely heavy and Fire absolutely light: whilst Air and Water are, each of them, both relatively light and relatively heavy.

23ª 9–10. *τὰ . . . ποιητικά.* This is not inconsistent with 29ᵇ 20–22, where Aristotle denies that heaviness and lightness are the source of action–passion (cf. and contrast Bäumker, p. 242₆). Earth, Air, Fire, and Water are necessarily heavy and light, and essentially *ποιητικὰ καὶ παθητικά*: but their action and passion are not the effects of their heaviness and lightness.

23ª 12–22. *ἐπεὶ . . . οὔ.* Aristotle has substituted *κινητικῶν* for *ποιητικῶν* and *κινητῶν* for *παθητικῶν* (23ª 12): but there is an ambiguity in both pairs of terms, to which he here calls attention. For (i) A may 'move' B without itself being moved *by the latter*: or (ii) A may 'move' B; and, in doing so, be itself moved by B (ª 13–14 *ἀλλὰ . . . ὄν*. That this is the distinction here intended, is rightly emphasized by Zabarella and is manifest from Aristotle's treatment below, 24ª 24 ff.). Thus (i) the *πρῶτος οὐρανός* (to take the chief instance which Aristotle here seems to have in mind), being itself moved by the *πρῶτον κινοῦν*, imparts movement to the Lower Cosmos, and is *relatively to the latter ἀκίνητος*: for the Lower Cosmos does not react upon the *οὐρανός*. We may speak of the *οὐρανός* as 'acting upon' the Lower Cosmos, and of the latter as 'being acted upon' by it. But though there is action and passion, and moving and being-moved, there is no *reaction* and *re-passion* in this relation and no *reciprocal* being-moved and moving. And though we may speak of *ἁφή*, it is not 'physical contact' proper. What 'touches'—viz.

the οὐρανός—is not heavy or light: hence there can be no *reciprocal* action–passion between it and the Lower Cosmos, and therefore the latter cannot 'touch' it. But 'physical contact' proper is reciprocal.

On the other hand (ii) the term ποιοῦν *in the strict sense* applies only to a body which causes a change of πάθος in another body. The process here is ἀλλοίωσις, and the patient reacts upon the agent so that the latter is in turn itself patient. This kind of κίνησις can occur only between bodies which are heavy and light, or both heavy, or both light (cf. * 23ª 9)—i. e. between bodies of the sublunary world. Thus, e. g., the hot body warms the cold body and, in doing so, is itself cooled *by the latter*. And this reciprocal κίνησις (i. e. ἀλλοίωσις) presupposes *reciprocal* contact, or 'physical contact' proper.

23ª 17–20. εἴπερ . . . θερμόν: 'if we are to speak of *agent* in a sense contrasted with *patient*, and if this' (τοῦτο, viz. the term πάσχον) 'is to be applied only to those moved things whose motion is a qualitative affection—i. e. a quality, such as White or Hot, in respect to which they are moved only in the sense that they are *altered*.'

23ª 22–25. ἀλλ' . . . πάσχειν. The conditions which must be satisfied by two bodies, if they are to 'touch' *in the widest and most general sense of the term* (καθόλου μέν), are (a) that they should have θέσις, and (b) that the one should be κινητικόν and the other κινητόν. These conditions are satisfied e. g. by the οὐρανός and the Lower Cosmos in their relation to one another. But if two bodies are to 'touch one another'—i. e. if there is to be *reciprocal contact* (contact in the strictest sense) between them (πρὸς ἄλληλα δέ, sc. ὁ διορισμὸς τοῦ πρὸς ἄλληλα ἅπτεσθαι)—they must (a) have θέσις, and (b) *alter* and *be altered by* one another. (The words ἐν οἷς ὑπάρχει τὸ ποιεῖν καὶ τὸ πάσχειν define the kind of κινητικὸν καὶ κινητόν which reciprocal contact demands.) These conditions are satisfied only by the bodies of the Lower Cosmos; for they alone are capable of an action–passion which is simultaneously a re-passion and reaction. For διορισμός, cf. *34ᵇ 20–30.

23ª 25–33. ἔστι . . . ἐκείνου. In almost all the processes which we observe in the sublunary world that which *moves* or *acts* is in turn *moved* or *acted upon* by that which it moves or on which it acts. Hence we find it difficult to conceive a contact which is not reciprocal. Nevertheless we do sometimes speak of a 'mover' communicating motion by 'just touching' (ª 29 μόνον) the moved:

as, indeed, we speak (metaphorically) of the man who grieves us as 'touching' us, without suggesting that we 'touch' him.

If a 'mover' communicates motion without being moved by that which it moves (^{a} 31 *ἀκίνητον ὄν*, cf. * $23^{a}12$–22), we must admit a 'contact' which is not reciprocal.

23^{a} 26. *σχεδόν*. There are exceptions: e. g. (as Philoponos points out) the *ἐρώμενος κινεῖ* without necessarily being 'moved' in turn by the lover.

23^{a} 30. *ὁμογενῆ*. For the form, see Bonitz, *Ind.* 510^{b} 10–11. The meaning of *τὰ ὁμογενῆ* here is explained below, 23^{b} 29—24^{a} 5.

23^{a} 34. *τῆς ἐν τοῖς φυσικοῖς*, i. e. as contrasted with (a) *ἁφή* between the mathematical things, and (b) the one-sided *ἁφή* of the *οὐρανός* and the Lower Cosmos: cf. * 22^{b} 29.

A. 7

23^{b} 1—24^{b} 24. *περὶ . . . τρόπον*. In this chapter, which together with the next two chapters explains *ποιεῖν–πάσχειν* (cf. * 22^{b} 1–26), Aristotle discusses and answers the question 'What kind of things can act and suffer action reciprocally?'

He begins (23^{b} 1–15) by quoting two apparently conflicting views, together with the arguments of their advocates. The first view—that Like cannot be affected by Like, i. e. that only Unlikes or Differents can act and suffer action reciprocally—he attributes to the majority of his predecessors. The second view—that what acts and suffers action must be Like, i. e. Identical—he ascribes to Demokritos. Next (23^{b} 15—24^{a} 9) he develops his own view by a criticism of his predecessors. The true doctrine is:—'What acts and suffers action reciprocally must be contrasted *species* within the same *genus*, or contrary forms of the same matter'. The views of his predecessors (he urges) each mistook a part of the truth for the whole. Each expressed an essential 'moment' of the truth; but since each claimed to express the whole, each became false and conflicted with the other. He then (24^{a} 9–24) confirms his own theory (a) by showing that it explains the fact that the agent assimilates the patient to itself, and (b) by tracing the origin of the rival—and mistaken—theories. Whereas what acts and suffers action must be contrary determinations of the same *substratum*, linguistic usage attributes action and passion now to the *substratum* and now to the *contraries*; and the false theories arose from exclusive attention to the one or the other of these subjects, of which action and passion are commonly predicated.

Finally (24ª 24 – ᵇ 22) Aristotle (a) contrasts *primary* and *proximate* agents, and explains that the *primary* agent is unaffected in its action as the *first* 'mover' moves without being moved: and (b) distinguishes agent from final cause.

23ᵇ 2. ὑπεναντίους. This word is repeated below (ᵇ 16), but at ᵇ 17 the apparent contrariety is called *ἐναντιολογία*. Aristotle uses *ὑπεναντίον* and *ἐναντίον* indifferently, except that *ὑπεναντίον* is sometimes somewhat wider and vaguer in meaning. Thus, e.g., in *Post. Anal.* 76ᵇ 32 *τὸ ὑπεναντίον τοῦ μανθάνοντος τῇ δόξῃ* covers the two cases specified in the preceding sentence, viz. (i) that in which the pupil has no opinion on the subject, and (ii) that in which the pupil's opinion is contrary to the thesis assumed by the teacher.

The two views here in question are in contrary opposition: for in substance they assert (a) No agents and patients are identical, and (b) All agents and patients are identical.

The opposition between two particular propositions conflicting in quality ('Some A is B'—'Some A is not B'), which formal logicians call *sub-contrary opposition* (cf. e.g. Sanderson, *Logicae Artis Compendium*, 8th ed., p. 95), is not here in point. Moreover, Aristotle does not call the opposition of particular affirmative to particular negative an opposition of *ὑπεναντία*: he denies that it is anything more than a verbal opposition (cf. *Prior Anal.* 63ᵇ 27 *τὸ γὰρ τινὶ τῷ οὐ τινὶ κατὰ τὴν λέξιν ἀντίκειται μόνον*).

23ᵇ 5–6. πάντα . . . ὁμοίοις. Aristotle is quoting the authors of the theory. By 'like' they mean 'absolutely identical'. If A is 'like' B (they argue) A and B have all the same properties and *in the same degree* (*ὁμοίως*). Hence there can be no *ποιεῖν–πάσχειν* between A and B. For although in action–passion the agent *ἀντιπάσχει* and the patient *ἀντιποιεῖ*, one of the two things concerned in the transaction (viz. the 'agent') must be *μᾶλλον ποιητικόν*, and the other (viz. the 'patient') must be *μᾶλλον παθητικόν*.

The qualification *ὁμοίως* is important: for if A and B were both hot, but A were hotter than B, A might act on B. A's action, however, according to the theory, would be due not to its 'likeness', but to its 'unlikeness': cf. ᵇ 8–10.

23ᵇ 6–7. τὰ . . . πέφυκεν. *τὰ δ' ἀνόμοια* answers *τὸ μὲν ὅμοιον* (ᵇ 3–4), and *πέφυκεν* (after *ὡς*, ᵇ 3) is necessary, though *πεφυκέναι* is the better-attested reading. In ᵇ 7 and ᵇ 14 FL add *εἰς* after *πάσχειν*:

but the accusative alone is more idiomatic. *ποιεῖν καὶ πάσχειν* is treated as a single verb with the same construction as if *ποιεῖν* stood alone : cf. also * 24^{b} 25.

23^{b} 7–10. **καὶ . . . ὀλίγῳ.** Cf. *Parva Naturalia* 469^{b} 21—470^{a} 7 ; Theophr. fr. 3 (*περὶ πυρός*) § 1 *τὸ δὲ πῦρ γενᾶν καὶ φθείρειν πέφυκεν αὐτό, γενᾶν μὲν τὸ ἔλαττον τὸ πλέον, φθείρειν δὲ τὸ πλέον τὸ ἔλαττον.* Aristotle's theory of the cause of Death seems to depend in part on an application of this principle (that 'the greater fire destroys the less'): cf. * 29^{b} 24–26.

23^{b} 10–11. **Δημόκριτος . . . μόνος.** It is strange that Aristotle should attribute this view to Demokritos *alone* : for in discussing the theory of Empedokles that 'Like perceives Like', he treats it as an application to the relation of Percipient and Perceived of the general principle that 'Agent and patient are like'. Cf. *de Anima*, e. g. 409^{b} 23 ff., 416^{b} 33 ff., where there is a reference to the present discussion of action–passion.

Both views are attributed to *groups* of thinkers, below, 24^{a} 22–24.

23^{b} 16–17. **ἐοίκασι . . . λέγειν.** 'The two views seem to be (but are not really) in manifest conflict.' There is, however, no trace of *φαίνεσθαι* in Γ or Φ^{c}.

23^{b} 17–18. **αἴτιον . . . ἑκάτεροι.** The conflict is only apparent. For both views express a part of the truth ; and they can be reconciled by being merged in a third view which adequately expresses the fact as a whole. The 'fact as a whole' is *contrasted forms of the same matter acting and suffering action reciprocally*. One view insists upon the identity of the matter, and the other view upon the contrariety of the forms, as the sole and sufficient condition of action–passion : cf. * 23^{b} 1—24^{b} 24, 24^{a} 14–24.

23^{b} 18–24. **τό . . . πᾶν.** It is false that 'Like is affected by Like', if this means that the identity of A and B is the sole and sufficient cause of their action–passion. For (i) if A and B are absolutely identical, neither will have any prerogative in any transaction between them (cf. * 23^{b} 5–6) : and (ii) if Like acts on Like *qua* like (i. e. identical), everything will be able to 'act on' (change, move, destroy) itself, and therefore there will be nothing *ἄφθαρτον* or *ἀκίνητον*. But the change and movement in the physical universe necessarily imply *some* things which are *ἄφθαρτα, ἀΐδια*, and *ἀκίνητα* : cf. *Phys.* Θ. 3 ff., *Metaph.* 1071^{b} 3 ff.

In ^{b} 21 it is necessary to read *εἴ τε* (cf. Bonitz, *Ind.* 217^{b} 9), instead of *εἴτε* with Bekker.

In ^{b}22 I have accepted *οὕτως ἐχόντων* on the authority of L, though with great hesitation.

23^b 24–29. *τό . . . ἐστίν.* The opposite view is also false, if it means that the absolute otherness of A and B is the sole and sufficient cause of their action–passion. For to 'act on' a thing is to make it change its nature. But if two things are absolutely other (e. g. Line and Whiteness), neither can get any grip of the other, neither can affect the other's nature. Only Contraries or Intermediates—i. e. only contrasted forms *of the same*—can 'act on' one another.

23^b 26–29. *πλὴν . . . ἐστίν.* A white thing may 'act on' a line which happens to be also black—i. e. it 'acts on' the black. It does not really 'act on' the line, for it does not alter the line's nature. The line remains a line, even when its coincident property, black, has been altered into another coincident property—e. g. white or grey.

In ^{b}28 the better-attested reading is *ἑαυτά* (i. q. *ἄλληλα*). Philoponos rightly interprets *ὅσα ἐξ ἐναντίων ἐστίν* (^{b}29) as *τὰ μεταξύ*: cf. 24^a 8. The general principle is that *τὰ μεταξὺ ἔν τε ταὐτῷ γένει πάντα καὶ μεταξὺ ἐναντίων καὶ σύγκειται ἐκ τῶν ἐναντίων ἅπαντα* (*Metaph.* 1057^b 32–34). Thus the different species of the genus Colour form a scale. The extremes of the scale are White and Black: and these are *ἐναντία* to one another, for white is *χρῶμα διακριτικὸν ὄψεως*, and black is *χρῶμα συγκριτικὸν ὄψεως* (cf. *Topics* 119^a 30, *Metaph.* 1057^b 8–9). The other colours are *ἐκ λευκοῦ καὶ μέλανος* (cf. e. g. *Phys.* 188^b 24), i. e. 'blends' of white and black, and fall on the scale between its extremes. Each intermediate colour is *relatively* *ἐναντίον*, i. e. functions as an *ἐναντίον* relatively to any other intermediate and to either extreme. The intermediates are therefore said *ἐναντίωσιν ἔχειν* (cf. e. g. 23^b 30–31). Since Aristotle conceives *αἴσθησις* as essentially a *δύναμις κριτική*, i. e. a power of discriminating between *ἐναντία*, or between the intermediates which are 'blends' of the *ἐναντία*, the general principle *ought* to apply to the field of each of the five senses. Taste, we are told, discriminates between sweet and bitter; hearing between treble and bass; touch between hot and cold, and hard and soft. But it does not seem possible to work out the conception of a scale in all the fields with the same precision as in those of colour and sound.

23^b 29—24^a 9. *ἀλλ' . . . τούτοις.* The true doctrine is that action–passion takes place between things which are contrary forms of the same matter, differentiations of an identical *sub-*

stratum, contrasted species within the same genus. Agent and patient, therefore, are both 'like' and 'unlike'. The result of action–passion is to assimilate the patient to the agent.

The doctrine is summarized in the *de Anima* (417ª 20) in the formula *πάσχει . . . τὸ ἀνόμοιον, πεπονθὸς δ' ὅμοιόν ἐστιν*, and it is applied to Nutrition, Growth, Sensation, and (with modifications) to Thought. There is a reference to the present passage in the *de Anima* 417ª 1–2.

Philoponos is right in calling the argument here **διάλληλος**. All that Aristotle does is to bring out the reciprocal implication of contrariety and action–passion. From the fact that contraries are such as to act and suffer action, he infers that agent and patient must be different forms of the same (23ᵇ 29—24ª 5): and from the fact that agent and patient are different forms of the same, he infers that (only) contraries are such as to act and suffer action (24ª 5–9).

For the form **ὁμογενές** (24ª 1), see * 23ª 30.

23ᵇ 33—24ª 3. πέφυκε . . . ἀλλήλων. This parenthesis is intended to justify the assertion just made and the inference drawn from it. It is a law of nature (*πέφυκε*) that *τὸ ὁμογενὲς ὑπὸ τοῦ ὁμογενοῦς πάσχει*: and the law holds good in all instances of action–passion precisely because 'contraries are in every case within a single identical kind, and it is contraries which reciprocally act and suffer action'.

24ª 8–9. καὶ γὰρ . . . τούτοις. The argument apparently is:— Action–Passion necessarily involves **ἀλλοίωσις** (cf. * 23ª 12–22) which is a form of *γένεσις καὶ φθορά* (it is *γένεσις καὶ φθορά τις*). Now there can be no *γένεσις καὶ φθορά* in any sense whatever except between *ἐναντία*: hence *ποιεῖν–πάσχειν* is necessarily between *ἐναντία*.

24ª 9–14. διὸ . . . γένεσις. Aristotle's doctrine, combined with the general principle that *γένεσις* is a change into the contrary, explains the fact that the agent assimilates to itself the patient.

24ª 14–15. καὶ . . . φύσεως. 'And, again, it is intelligible that the advocates of both views, although their theories are not the same, are yet in contact with the nature of the facts.'

κατὰ λόγον, i. q. *εὔλογον*.

In spite of the overwhelming manuscript authority for **ὁμοίως**, **ὅμως** is clearly required. For *φύσις* ('the essence of the matter'), cf. Bonitz, *Ind.* 839ª 43 – ᵇ 2.

24ª 15–24. λέγομεν . . . τοὐναντίον. Cf. * 23ᵇ 17–18.

In ^{a} 17 the reading of H (cf. Φ^c) is to some extent confirmed by *τἆλλα*: but 'the stone' is not a very likely subject of 'being heated'.

In ^{a} 22 *ἐκεῖνο* is of course *τὸ ὑποκείμενον*, and in ^{a} 23 *θάτερα* are *τὰ ἐναντία*. *τοὐναντίον* (^{a} 24), 'the opposite', i. e. that agent and patient must be absolutely 'other'.

24^a 24 – ^{b} 22. τὸν . . . ἀληθές. At least in expression, if not also in substance, the doctrine of this passage is (i) *ambiguous*, and (ii) *divergent* from Aristotle's doctrine elsewhere.

(i) Aristotle's object is to establish a certain parallelism between *ποίησις* (i. q. *ἀλλοίωσις*, cf. * 23^a 12–22), *ποιεῖν–πάσχειν*, *τὸ ποιοῦν*, and *κίνησις*, *κινεῖν–κινεῖσθαι*, *τὸ κινοῦν*.

The term *τὸ κινοῦν* is applied (a) to that which contains 'the originative source' (i. e. *the first* in the series of causes, 24^a 27–28) of a movement: and also (b) to 'that which is last' (in the series of causes), i. e. to the cause 'next to the body which is being moved and to that which is coming-to-be' (24^a 29 *τὴν γένεσιν*—if the text is sound—must mean *τὸ γιγνόμενον*).

Similarly *τὸ ποιοῦν* is applied (a) to that which contains 'the originative source' of a *ποίησις*—e. g. to the doctor, *qua* containing in his soul the *τέχνη ἰατρική* which is the first in the series of causes of the alteration called 'healing': and also (b) to 'that which is last', e. g. to the wine or the food prescribed by the doctor, which are the proximate causes of the patient's recovery.

Now *τὸ κινοῦν in sense* (*a*) need not itself be moved by the body which it is moving. It is therefore—or it may be—*relatively* *ἀκίνητον*. The *absolutely first* moving cause *must* be 'unmoved' (cf. 24^a 31 *ἐπ' ἐνίων δὲ καὶ ἀναγκαῖον*) and indeed *absolutely* 'unmoved': but even the *πρῶτος οὐρανός*, although it is itself moved by the *absolutely first* mover, is *relatively* *ἀκίνητος*, since it is unmoved by the bodies which it sets moving (cf. * 18^a 4–5, * 23^a 12–22). On the other hand, *τὸ κινοῦν in sense* (*b*) is, in moving, always moved by that which it moves.

Similarly *τὸ ποιοῦν in sense* (*a*) is *relatively* *ἀπαθές*. The doctor, e. g., or the *τέχνη ἰατρική* in his soul, 'acts upon' ('alters') the patient, without suffering reaction from (being 'altered' by) the latter. But *τὸ ποιοῦν in sense* (*b*) must, in acting, itself be 'altered' by that on which it acts. The food or the wine, e. g., can only 'alter' (i. e. heal) the patient in so far as they are 'altered' by the latter's digestion.

Here, then, we have a *relatively* first, and therefore a *relatively* ἀπαθές, agent corresponding to a *relatively* first, and a *relatively* ἀκίνητον, 'mover' or efficient cause. And Aristotle explains (24ª 34–35) that ἰατρική, e. g., is ἀπαθές in its action, because it is not (like e. g. the food) a form *embodied in the same matter* which τὸ ὑγιαζόμενον involves.

But Aristotle proceeds to introduce, without further explanation, a new division of ποιητικά (agents or 'active things') into (a) those whose forms are *not in matter at all*, and (b) those whose forms are in matter (24ᵇ 4–13, cf. ᵇ 18–22). The *first* kind of ποιητικά—pure forms, i. e. ἐνέργειαι without any δύναμις—are clearly *absolutely* ἀπαθῆ and *absolutely* first agents: and they correspond to the *absolutely* first, and *absolutely* unmoved, 'mover' or 'movers'. The *second* kind of ποιητικά would include not only 'the food', but also 'the doctor'—and perhaps even the τέχνη ἰατρική (cf. * 24ª 34 – ᵇ 1). Such ποιητικά, because they involve matter, are always παθητικά, though some of them (e. g. the doctor) are *relatively* ἀπαθῆ since they are not subject to reaction from the things on which they act.

(ii) Elsewhere, when Aristotle is analysing κίνησις and ποίησις, the final cause is regarded as the ἀρχὴ τῆς κινήσεως—as the first in the series of moving or acting causes. Thus God is the πρῶτον κινοῦν as the ultimate object of love (cf. e. g. *Metaph.* 1072ᵇ 3). And though what moves the animal is the soul *qua* containing νοῦς or ὄρεξις (τὸ ὀρεκτικόν), yet νοῦς and ὄρεξις are themselves moved by τὸ νοητὸν and τὸ ὀρεκτόν:—i. e. the primary cause of the animal's movement is that which it conceives or imagines as τὸ πρακτὸν ἀγαθόν, and which, as thus conceived or imagined, inspires desire (cf. *de Anima* 433ª 9–30, ᵇ 11–12; *de Motu Anim.* 700ᵇ 4 ff.; *Metaph.* 1072ª 19 – ᵇ 11). Similarly ὑγίεια—the End at which the doctor aims—is prior to ἰατρική as the cause of healing (cf. *Metaph.* 1032ª 32 ff., * 20ᵇ 18–21).

Here, however, Aristotle refuses to reckon the final cause as ποιητικόν, except in a metaphorical sense, for a reason explained below, 24ᵇ 14–18.

24ª 27. ἀρχή: cf. * 29ª 5.

24ª 30–33. τὸ . . . ἀπαθές. Since ἐν μὲν κινήσει (ª 31) corresponds to ἐπὶ δὲ ποιήσεως (ª 32), the passage would be simplified grammatically by E's omission of κινοῦν (ª 30). But the better-attested text is probably right.

24ª 31. ἐνίων. The reference here and below (ᵇ 21 ἔνια τοιαῦτα)

is no doubt to 'the heavenly Intelligences', God and the Spirits of the Stars: cf. e.g. *Metaph.* 1073ª 23 ff.

24ª 34 – ᵇ 1. ὅσα . . . ὑγιαζομένου. We should have expected Aristotle to cite *the doctor*, rather than *ἰατρική*, as an instance of a *ποιητικόν* whose matter is not *the same* as that of its patient: *ἰατρική*, we might suppose, is a *ποιητικόν* whose 'form is not in matter *at all*' (cf. ᵇ 4–5). It must, however, be remembered that Health—the 'form', of which *ἰατρική* is the analysis and resynthesis (cf. * 20ᵇ 18–21)—is an *εἶδος ἔνυλον*, and cannot be defined without including in its definition those material constituents of which it is the proportionate adjustment.

24ᵇ 4. ἁπτόμενον: cf. * 23ª 12–22.

24ᵇ 6–9. τὴν . . . θερμαίνεσθαι. 'For we maintain that one and the same matter is *equally*, so to say, the basis of either of the two opposed things—being as it were a kind of which they are contrasted species; and that *that which can be hot* must be made hot, provided the heating agent is there, i. e. comes near.'

Thus the food (or wine), which cools (or heats) the patient's body, must be itself heated (or cooled) in acting, because it and the patient's body are contrasted forms of the same *ὑποκείμενον*.

ὡς εἰπεῖν (ᵇ 6) qualifies *ὁμοίως*. The food and the patient's body can be said to have the same matter *equally* or *alike* only in a loose sense: just as it is only loosely that e. g. dog and bird are *ὁμοίως ζῷον*.

24ᵇ 13–18. ἔστι . . . παθητικόν. Aristotle briefly justifies the separation of efficient cause and final cause (cf. * 24ª 24 – ᵇ 22), and indicates the part played in *ποίησις* by formal and material causes.

The final cause of a *ποίησις* is an 'established state' of *τὸ πάσχον*, in which it is completely itself. The final cause of healing, e. g., is health, which is the normal state or 'form' of the living body. So far as health *is there*, the body is already completely itself—there is no further goal for it to attain (ᵇ 17 *οὐκέτι γίνεται, ἀλλ' ἔστιν ἤδη*).

We can speak of a cause as *ποιητικόν*, only when it is such that its presence starts its correlative *πάσχον* on a process of development, or coming-to-be. Thus, when the doctor *is there*—i. e. comes into active relation with his correlative *πάσχον*, a diseased body—a *γένεσις* is at once set up in the patient's body, in which it moves towards the attainment of its normal state, health.

24^b 15–16. τοῦ . . . ὑπάρχῃ. The object of this irregular construction is to avoid the awkwardness of τοῦ μὲν ποιοῦντος ὑπάρχοντος.

24^b 18. ἡ . . . παθητικόν. It is matter, *qua* matter, which is παθητικόν: i. e. matter (or the material cause) contributes to ποίησις, in so far as every ποιοῦν implies a correlative πάσχον. It follows from this—as Aristotle has already maintained—that if any ποιητικόν is itself absolutely without matter, it must be absolutely ἀπαθές (24^b 18–22).

A. 8

24^b 25—26^b 28. πῶς . . . χωρίζεσθαι. Two typical theories of the mechanism of ποιεῖν–πάσχειν are examined in this chapter: viz. (i) the theory that the agent acts by penetration, since the patient has 'pores', and (ii) the theory of Leukippos and Demokritos, which explains action–passion, as it explains all other physical phenomena (e. g. growth, coming-to-be, passing-away), by the assumption of Indivisible Solids and a Void.

Of the advocates of 'pores', Aristotle mentions only Empedokles: but one other representative of the doctrine, who was probably its originator, can be named with certainty, viz. Alkmaion of Kroton. (On Alkmaion see Diels, pp. 100–104; Burnet, § 96; Beare, pp. 11 ff., 93 ff., 131 ff., 160.)

In the first part of the chapter (24^b 25—25^b 11) Aristotle shows that the theory of pores is equivalent to that of the Atomists, so far as an explanation of ποιεῖν–πάσχειν is concerned. He also traces the affiliation of Atomism to Eleatic Monism, and points out the superiority of the former. *Next* (25^b 12—26^b 6) he begins to criticize Empedokles, contrasting his theory unfavourably with that of the Atomists. The latter explain the γένεσις and φθορά of all physical bodies as a composition out of, and a dissolution into, the Indivisible Solids. But Empedokles treats Air, Earth, Fire, and Water as *elementary*: and hence neither explains nor could explain the γένεσις or φθορά of the big masses of these 'elements' which we see in nature. This leads Aristotle to refer to Plato's theory in the *Timaeus*, which postulates Indivisible Planes as the ultimate constituents of Air, Earth, Fire, and Water, and therefore of all physical bodies. Having distinguished this theory from that of Leukippos (for Leukippos postulates a Void, which Plato denies; and *his* Indivisibles are solids, whereas those of Plato are planes), he proceeds to criticize the view of

Leukippos and Demokritos. *Finally* (26^{b} 6–28) he returns to the doctrine of pores, which he subjects to an annihilating criticism.

24^{b} 25. πῶς . . . λέγωμεν. In the last chapter Aristotle has explained 'what action and passion are, what things exhibit them, why they do so, and in what manner' (24^{b} 22–24).

The 'next step' in the inquiry (*πάλιν*: cf. e. g. *Phys.* 214^{b} 13; Bonitz, *Ind.* 559^{b} 13 ff.) is to explain how it is possible for action–passion, thus understood, to occur: i. e. what must be the structure of bodies, if action–passion is to take place.

τοῦτο, sc. *τὸ ποιεῖν καὶ πάσχειν*, which is treated as a single verb, cf.* 23^{b} 6–7.

24^{b} 27. τοῦ . . . κυριωτάτου. In the strictest sense of the term *ποιεῖν* occurs only in *ἀλλοίωσις*, i. e. action–passion involves re-passion–reaction. Since it is only the *last* (or *proximate*) agent whose action is re-passion, the last agent is 'the agent in the strictest sense' (*κυριώτατον*). Cf. * 23^{a} 12–22, * 24^{a} 24–^{b} 22.

Perhaps we ought to insert ⟨*τοῦ*⟩ before *ἐσχάτου*.

24^{b} 27–32. καὶ τοῦτον . . . μᾶλλον. The chief evidence for Alkmaion's theory of perception is Theophrastos, *de Sensu*, §§ 25, 26 (quoted by Diels, p. 101: cf. Beare, ll. cc.). All that we are there told about 'pores' is that (according to Alkmaion) 'all our perceptions are in some way closely connected with the brain. That is why, if the brain is disturbed or displaced, the perceptions are mutilated and arrested (*πηροῦσθαι*): for the brain then blocks the pores through which the perceptions come' (*ἐπιλαμβάνειν γὰρ τοὺς πόρους, δι' ὧν αἱ αἰσθήσεις*).

The theory of Empedokles is reported at length, and criticized in detail, by Theophrastos, *de Sensu*, §§ 7–24 (Diels, pp. 168–171). See also two fragments of Empedokles, fr. 84 on Vision (Diels, pp. 196–7: cf. Beare, pp. 14 ff.), and fr. 99 on Hearing (Diels, p. 200: cf. Beare, pp. 95 ff.).

Theophrastos, l. c., § 7 (cf. Beare, pp. 204–5) reports that 'Empedokles explains the perception of all the special senses on the same principle. He says that we perceive, because the objects of each sense fit into the pores of the sense in question. That is why one sense cannot discern the objects of another: for its pores are too wide or too narrow, so that, of the objects of the other senses, some go right through the pores without touching, whilst others cannot enter at all'. The objects, which fit (or fail to fit) the pores, are clearly the 'effluences' (*ἀπορροαί*) which all

things give off: cf. Empedokles, fr. 89 (Diels, p. 197), Theophrastos, l. c., *φέρεσθαι δὲ τὰ χρώματα πρὸς τὴν ὄψιν διὰ τὴν ἀπορροήν.*

The *first part* of Aristotle's statement here (^{b} 27–29 *καὶ τοῦτον . . . πάσας*) refers to a theory of this kind. But the *second part* (^{b} 29–32 *ἔτι . . . μᾶλλον*) refers to a theory which explains the greater or less transparency of different bodies by their possession of a greater or smaller number of pores and by the way in which their pores are disposed. We can see things through air and water, and in general through transparent bodies, because such bodies have a multitude of close-set pores, which are arranged serially so as to form straight channels or passages right through them. Does this mean that the 'effluences' from the visible objects can travel more easily through bodies with such a structure? Or does it mean—as Philoponos (p. 153) interprets—that the *ὄψεις* (i. e. the 'visual flames' or 'rays' proceeding from the eyes) can pass through such *media* and thus 'lay hold' of the visible objects?

On the whole, it would seem most probable that Philoponos is right; and that Aristotle is referring to a feature in Empedokles' theory of Vision which nobody has yet succeeded in reconciling with the doctrine of 'effluences'. For, as is well known, nothing is said in Empedokles' fragment on Vision (fr. 84: cf. also Plato, *Timaeus*, 45 b ff.) about 'effluences' fitting into the pores of the sense of vision. Vision is conceived as an activity proceeding from the eye. The fire inside the eye flows through the pores of the membranes which contain it, much as the light inside a lantern 'leaps through' its transparent sides (cf. Burnet, pp. 248–249; Beare, pp. 15–16).

Aristotle himself complains (*de Sensu* 437^{b} 23—438^{a} 5) that Empedokles 'sometimes appears to think that we see owing to the light going forth from the eyes', whilst at other times he explains vision 'by the effluences from the things seen'.

24^{b} 32—25^{a} 2. *οἱ . . . ἐστίν.* The advocates of pores are contrasted unfavourably with the Atomists. For the theory of pores is a theory of the structure of *some φυσικὰ σώματα* only (^{b} 32 *ἐπί τινων*), viz. only of *τὰ ποιοῦντα καὶ πάσχοντα* and of *τὰ μιγνύμενα*. Hence it attempts to explain only *ποιεῖν–πάσχειν* and *μίξις*. But Atomism is based upon principles which go to the root of things: for the Atomists postulate that all the perceptible bodies in nature are composed of Indivisible Solids interspaced by Voids. Hence their theory applies to the structure of *all φυσικὰ σώματα* (^{b} 35 – ^{a} 1 *περὶ πάντων*), and enables them to give a systematic and

consistent explanation of γένεσις and φθορά, of ἀλλοίωσις and αὔξησις, as well as of ποιεῖν–πάσχειν and μίξις: cf. 15^{a} 34–35, 16^{a} 6–8.

In ^{b} 34 Prantl and Diels adopt φησιν (JL). But there is no reason to suppose that Empedokles was the only advocate of pores who applied the theory to explain μίξις: and though the construction with φασιν is a little harsh, it is not impossible.

25^{a} 1–2. ἀρχὴν . . . ἐστίν. Apparently this means that the Atomists 'took as their starting-point what naturally comes first', i. e. based their theory on postulates expressing fundamental facts. They began at the beginning, and not in the middle. But, in view of the immediately following passage (25^{a} 2 ἐνίοις γὰρ . . . ^{b} 5 στερεῶν), in which Aristotle traces the affiliation of Atomism to the theory of the Eleatics, it is tempting to read κατὰ φύσιν, ᾗπερ ἔστιν. The words would then refer directly to Parmenides (cf. e. g. fr. 8, l. 1, Diels, p. 118, μοῦνος δ' ἔτι μῦθος ὁδοῖο λείπεται ὡς ἔστιν) and would mean that the Atomists' theory is not based upon mere δόξαι βρότειαι, but upon a principle drawn from the Parmenidean 'Way of Truth'. They took as their starting-point the fundamental truth that the Real *is*.

25^{a} 2–16. ἐνίοις . . . κενόν. Aristotle here sketches certain arguments which led the Eleatics (ἐνίοις: the reference, as we shall see, is *probably* to Zeno, and *certainly* to Melissos, as well as to Parmenides) to maintain that 'what is' must be ἓν καὶ ἀκίνητον.

The general form of the arguments is 'dialectical', i. e. the Eleatics show that their pluralist opponents cannot, on their own premisses, render intelligible the plurality and the motion which they advocate.

The pluralist views in question are two, viz. (i) that the real is Many and in no sense One, the Many being separated from one another by the Void: and (ii) that the real is 'discretes-in-contact', i. e. a Many not interspaced by a Void, but contiguous.

The advocates of *the first view* were, in all probability, the Pythagoreans (cf. * 25^{a} 4–6): and the Eleatics claim to dispose of it, because—as they maintain—there can be no such thing as a Void. The *second view* is that of Empedokles: and the Eleatics urge against it, that it is no more able than the Pythagorean theory to render plurality and motion intelligible (cf. * 25^{a} 6–13).

25^{a} 4–6. κινηθῆναι . . . διείργοντος. These theses as to the

implications of motion and plurality, which the Eleatics accept, are at the same time maintained by their opponents: and the opponents' theory, which rests upon them, is summarized below (^{a} 7–8) in the words πολλὰ καὶ μὴ ἓν εἶναι καὶ κενόν. The opponents in question cannot be the Atomists: for Atomism (cf. 25^{a} 23 ff.) was developed *under the influence of, and subsequently to*, the Eleatic criticism of this particular theory of a Many and a Void. On the whole, there is very little doubt that the pluralists in question here, and in the second part of Parmenides' poem (cf. Burnet, pp. 182 ff., 314 ff.), are the Pythagoreans.

The admitted theses are: (i) if a body is to move, there must be an empty place for it to move into. Motion implies an *independently existent* empty place or 'void' (^{a} 5 κεχωρισμένου). If there is to be motion, it is not enough that we can *in thought* abstract the place, which a body fills, from the body which fills it (cf. Aristotle's discussion of τὸ κενόν, *Phys.* 213^{a} 12 ff.): and (ii) a plurality of reals implies something other than the reals (a not-real) to separate them from one another. Thus, e.g., the Pythagoreans postulated a κενόν, ὃ διορίζει τὰς φύσεις (*Phys.* 213^{b} 22–27: cf. Burnet, p. 108$_{4}$).

25^{a} 6–13. τοῦτο . . . κίνησιν. 'And in *this* respect' (i.e. for rendering intelligible the being of a Many), 'they insist, the view that the universe is not continuous, but discretes-in-contact, is no better than the view that there are Many (and not One) and a Void. For suppose that the universe is discretes-in-contact. Then, if it is through-and-through divisible, there is no One, and therefore no Many either, but the Whole is void; whilst to maintain that it is divisible at some points, but not at others, looks like an arbitrary fiction. For up to what limit is it divisible? And for what reason is part of the Whole indivisible, i.e. a *plenum*, and part divided? Further, they maintain, it is equally necessary to deny the existence of motion.'

Aristotle is here reproducing the gist of an Eleatic argument against a pluralist theory which dispenses with a Void. The Pythagoreans, as we saw, were obliged to postulate an existent Void in order to account for motion and plurality: and such a postulate (Parmenides and Zeno contend) is a contradiction in terms, for it is equivalent to the assumption that 'what is not' *is*. But another form of pluralism (viz. that of Empedokles, cf. 25^{b} 5–10, * 26^{b} 8–10) attempts to conceive the real as a Many, without introducing a Void. The Universe is not One, since

it is not continuous: it is divided into many constituents, which, however, are contiguous and therefore do not imply a Void.

Empedokles himself expressed his theory differently. He said that no part of the Universe was 'empty' (cf. fr. 13, 14; Diels, pp. 176, 177): and he denied that the Whole (i. e. 'the Sphere') was homogeneous, as Parmenides had maintained. It was full of diverse matters—i. e., in the end, full of the four 'elements': and these 'ran through one another' (cf. e. g. fr. 17; Diels, pp. 177–9). Moreover, he had demonstrated that atmospheric air is not empty space (not a *κενόν*), but a thing or body (cf. Burnet, pp. 228, 229): hence, although he insists that bodies are porous, the pores are not 'voids', but 'full'—e. g. full of air, which is itself a body.

There is some evidence (Burnet, p. 312_1) that Zeno wrote an attack on Empedokles, and it is possible that the present argument (ª 6–13) reproduces the substance of one of his criticisms.

25ª 6. **οὐδέν.** EL have *μηδέν*, but *οὐδέν* is what we should expect consistently with the other negatives in the context.

25ª 7. **ἅπτεσθαι διῃρημένον**: cf. perhaps * 16ᵇ 4.

25ª 12–13. **ἔτι . . . κίνησιν.** The addition of *φάναι* (FHL) is probably due to a misinterpretation of ª 6–8. The argument is:—The view of Empedokles is no better than the Pythagorean view as regards the explanation of *plurality* (ª 6–8), and *motion* is as impossible on the former view as it is on the latter (ª 12–13).

25ª 15–16. **ἄπειρον . . . κενόν.** Parmenides and Zeno maintained that the one Real was finite: but Melissos held that it was infinite both temporally and spatially. Aristotle is no doubt quoting, or summarizing, an actual argument of Melissos. *περαίνειν* should be taken intransitively, as in Melissos, fr. 5 (Diels, p. 144) *εἰ μὴ ἓν εἴη, περανεῖ πρὸς ἄλλο.*

Translate: 'Some of them add that it is infinite, since the limit (if it had one) would be a limit against the Void.'

25ª 17. **περὶ τῆς ἀληθείας**: cf. Parmenides, e. g. fr. 8, l. 51 (Diels, p. 121).

25ª 17–23. **ἔτι . . . διαφέρειν.** Though the Eleatic theory appears to be logically impregnable, it is in violent conflict with the facts. Even a lunatic does not go so far as the theory demands in identifying objects which his senses present to him as different: though some people are mad enough to confuse what they have been accustomed to regard as honourable with what really is honourable.

I have marked a *lacuna* after *ἀληθείας* in ª 17, as I think we must

assume that one or more arguments against the Eleatic theory have dropped out. L reads ἐπεὶ for ἔτι—an obvious, but ineffective, attempt to restore the logic of the passage.

25ª 23–ᵇ 5. Λεύκιππος . . . στερεῶν. Leukippos recognized that coming-to-be and passing-away, motion and multiplicity, must be accepted as real on the evidence of sense-perception: but he also recognized the force of the Eleatic arguments. He was convinced by the latter that the Real—'that which is'—is a *plenum*; but he saw no difficulty in postulating empty space (*τὸ κενόν*), provided it is not regarded as 'real' in the proper sense, i. e. in the same sense as body. Hence he supposed an infinite number of minute (and therefore invisible) bodies, each 'real' in the sense of the Eleatic 'One', i. e. each a *plenum*. And he further supposed these minute bodies—the atoms—to be moving in empty space. 'Coming-to-be' he explained as the aggregation of several atoms to form a perceptible body: and 'passing-away' as the dissolution of such an aggregate into its constituent atoms. Cf. above, 15ᵇ 6–15 with the notes.

25ª 23–24. οἵτινες . . . λέγοντες. Perhaps this explains 15ᵇ 9–10 *ἐπεὶ δ' ᾠοντο τἀληθὲς ἐν τῷ φαίνεσθαι . . .*

25ª 26. ταῦτα, sc. *γένεσιν, φθοράν, κίνησιν, πλῆθος τῶν ὄντων.*

25ª 26–32. τοῖς δὲ . . . φθοράν. For the punctuation, cf. Diels, p. 344. Leukippos conceded to the Eleatics that motion required a Void: and he says (in agreement with them) that the Void is *μὴ ὄν* and that no part of *τὸ ὄν* is a *μὴ ὄν*, for *τὸ ὄν* in the strict sense of the term is absolutely full, a *plenum* without any gaps. But he thinks (in contrast to the Eleatics) that there is an infinite plurality of such 'Reals', and that they move in the Void; for the Void exists, though it is not a 'Real'.

25ª 33. ᾗ τυγχάνουσιν ἁπτόμενα. This is the point where Atomism becomes indistinguishable from the theory of Empedokles as Aristotle expresses it, viz. that the Real is 'discretes-in-contact': cf. * 25ª 6–13.

25ª 34. καὶ συντιθέμενα . . . γεννᾶν. Philoponos interprets this as a reference to the Atomists' explanation of *ἀλλοίωσις*. He supplies *τὰ πάθη* as the object of *γεννᾶν*, and says that we are to understand the *σύνθεσις* and the *περιπλοκή* of the atoms as their *θέσις* and *τάξις* respectively: cf. 15ᵇ 9, 15ᵇ 33—16ª 2. But, as the text stands, *γεννᾶν* can hardly mean anything but *γένεσιν ποιεῖν*, and the sentence simply repeats l. 32 with a slight variation. For the doctrine, cf. * 15ᵇ 33—16ª 2.

25ª 34–36. ἐκ . . . ἀδύνατον. τὸ κατ' ἀλήθειαν ἕν, sc. an atom, i. e. that which is a *plenum* without interspaces. τὰ ἀληθῶς πολλά, sc. the many aggregated atoms, which, though associated to form a perceptible body, never constitute a real One without interspaces.

For the principle here ascribed to Leukippos, cf. *Metaph.* 1039ª 7–11, where it is attributed to Demokritos.

25ª 36 – ᵇ 5. ἀλλ' . . . στερεῶν. The theory of Alkmaion and Empedokles, which explained πάσχειν by the hypothesis of pores, is extended by the Atomists to explain ἀλλοίωσις, φθορά, αὔξησις, κτλ.: only, instead of 'pores', they speak of the Void, i. e. empty interspaces between the atoms. A perceptible body for Empedokles is a porous whole: for the Atomists, it is a grouping of atoms separated by interspaces.

ὑπεισδυομένων στερεῶν (ᵇ 4–5) looks like a quotation from Leukippos.

25ᵇ 5–10. σχεδὸν . . . πόρους. We must not suppose that Empedokles would agree. As we know (cf. * 25ª 6–13; and below, * 26ᵇ 8–10), he did not admit a Void, but insisted that the pores were 'full'.

25ᵇ 7. τοῦτο, sc. τὸ πάντῃ πόρους συνεχεῖς εἶναι.

25ᵇ 10. οὓς . . . πόρους. The word πόροι does not occur in this sense in the surviving fragments of Empedokles. We have instead e. g. χοάνᾱι (fr. 84, l. 9; Diels, p. 197), ἄλοκες (fr. 100, l. 3; Diels, p. 200), the meaning being fixed by periphrases.

25ᵇ 13–15. καὶ περὶ . . . συμβαῖνον. The Atomists' explanation (cf. 25ª 31–34) is clear in itself, and it is a fairly consistent consequence of the basal assumptions—that there are indivisible solids and a 'void'—on which their whole philosophy depends.

τούτων (ᵇ 13), sc. τῶν περὶ Λεύκιππον καὶ Δημόκριτον (Philoponos).

25ᵇ 15. τοῖς . . . ἧττον, sc. τοῖς περὶ Ἐμπεδοκλέα ἧττον ὁμολογουμένως πρὸς τὰς αὐτῶν θέσεις φαίνεται συμβαῖνον.

25ᵇ 19–25. Ἐμπεδοκλεῖ . . . Πλάτων. Empedokles regards the 'four roots'—Earth, Air, Fire, and Water—as eternal and unchangeable: cf. * 15ª 4–8. But this view, as Burnet (p. 230₃) justly remarks, had been rendered 'almost unintelligible' to Aristotle owing to 'the criticism of the Pythagoreans and Plato' (cf. especially *Timaeus* 48 b). Hence Aristotle, here and above (15ª 3 ff.), assumes that Empedokles must have known that the origin and transformation of his 'elements' required explanation;

and regards it as an inconsistency and a failure of his theory that no explanation was offered.

τὸ σωρευόμενον μέγεθος ($^{b}22$: cf. * 26^{a} 30–31) is the actual mass of the 'elements' as we see them. Empedokles' 'elements' are present in masses which are clearly aggregates of smaller pieces: i. e. they are clearly composite bodies, divisible into simple constituents—not, like the 'primary bodies' of the Atomists (cf. 25^{b} 17–19), ἀδιαίρετα.

The reference to the *Timaeus* is to 53 c ff., where the particles, of which Earth, Air, Fire, and Water consist, are viewed as solids reducible to planes whose components belong to one of two types of triangle (cf. * 15^{a} 29–33). These triangles are the right-angled isosceles, and the right-angled scalene which is such that its hypotenuse is twice the length of its shorter side: cf. Martin, ii, pp. 234 ff.

25^{b} 27. ὁ μὲν . . . σχήμασι : cf. * 14^{a} 21–24.

25^{b} 28. τῶν . . . ἕκαστον. I have ventured to excise these words, since they would mean that *each* indivisible solid was defined by an infinity of figures and *each* indivisible plane by a finite number of figures—which is absurd.

ὡρισμένοις, i. e. the two typical triangular figures: see * 25^{b} 19–25.

25^{b} 29–32. ἐκ . . . μόνον. The best remedy in this passage is, I think, the excision of δύο τρόποι ἂν εἶεν. An alternative would be to read a colon after διακρίσεις (cf. J) and to insert γάρ after μέν (cf. Γ).

25^{b} 31–32. διά τε . . . ἕκαστον. Both the Void and Contact are required by the Atomists to explain either γένεσις or διάκρισις (φθορά): cf. 25^{a} 31–34.

25^{b} 34. ἐν τοῖς πρότερον λόγοις. The reference is to the *de Caelo* (cf. Introd. § 11, $*14^{a}$ 1) Γ. 1, especially 298^{b} 33 ff., Γ. 7, and Δ. 2.

25^{b} 34—26^{b} 6. περὶ . . . δυνάμει. Aristotle's deliberate compression of his present criticism of the Atomic theory within the limits of 'a short digression' (25^{b} 36) has somewhat obscured the logical connexion of his arguments. It is, however, possible to trace a single line of thought through the argumentation from 26^{a} 1–24; and thus to exhibit it as a reasoned exposure of the central weakness of Atomism, i. e. its failure to explain the relation of the indivisible solids to the qualities which are the objects of the special senses (cf. * 15^{b} 33—16^{a} 2: and, for the meaning of πάθη, cf. * 19^{b} 8–10). The criticisms in the re-

mainder of the passage (26^{a} 24 – ^{b} 6) are disconnected, but not obscure.

25^{b} 36—26^{a} 24. ἀναγκαῖον . . . ἀδιαιρέτοις. The argument may be thus expanded :—

According to the Atomists, the indivisible solids are characterized by figure alone (cf. * 14^{a} 21-24). And since, according to their theory, one body can be 'acted upon' by another only because it consists of Indivisibles interspaced by Void (i. e. only because the Indivisibles which compose it can move, shift their relative positions, come into contact with one another, &c.), the Indivisibles *themselves* cannot be 'acted upon'. They are ἀπαθῆ, i. e. they cannot receive any αἰσθητὸν πάθος. They are also necessarily unable to 'act', i. e. they cannot produce any πάθος, or any change of πάθος, in anything else. For (cf. e. g. 23^{b} 29 ff.) if A is to make B hot, or to change B from cold to hot, A must itself be hot (**26^{a} 1–3**).

Demokritos, it is true, attributes heat to the spherical Indivisibles. But if heat is the property of the spherical figure, it is a paradox not to assign cold to some other figure as its property (**26^{a} 3–6**). Are we then to suppose that the Atomists *do* attribute heat and cold to the Indivisibles, as properties respectively characterizing the spherical and some other figure? If so, on what principle are the other qualities excluded? It is a paradox to deny that the Indivisibles are heavy and light, hard and soft (**26^{a} 6–8**).

Indeed, Demokritos attributes not only heaviness to them, but different degrees of heaviness. 'The larger the mass of the Indivisible, the heavier it is', he says. But if so, he must admit that the larger the mass of a *spherical* Indivisible, the hotter it is (**26^{a} 9–11**). And this admission is fatal to the thesis which, as we saw (26^{a} 1–3), the Atomists *must* maintain. For if the Indivisibles differ from one another in degree of heat, they cannot be ἀπαθῆ (**26^{a} 11–12**). But neither can they be ἀπαθῆ, if hardness be attributed to them. For if hardness be attributed to any Indivisibles, its contrary, softness, must be attributed to other Indivisibles. It is as paradoxical to attribute hardness but not softness, as it is to attribute heat but not cold. But softness means 'tendency to yield to pressure': i. e. nothing which is soft can be ἀπαθές (**26^{a} 13–14**).

It is paradoxical, as we have seen, to deny to the Indivisibles all qualities except figure. But it is also paradoxical to attribute

to each Indivisible *one* quality, and *one only*, in addition to its figure. For these qualities necessarily go in pairs; i. e. if one Indivisible is *cold* + figured, another Indivisible must be *hot* + figured. What then becomes of the supposed 'uniformity of substance' in all the Indivisibles? And, finally, it is no less impossible to attribute to each Indivisible *more than one* quality in addition to its figure. For, being indivisible, it is without internal distinctions: all its qualities will belong to it in its single undifferentiated identity. Suppose, then, an Indivisible is e. g. hot, and therefore 'suffers action', is 'affected', in so far as it is chilled. Besides being hot, it will, on the hypothesis, also possess some other quality: e. g. it will be soft. And its softness will qualify its indivisible identity, which is also qualified by its heat. Hence *qua* itself—*qua* hot—it will 'yield to pressure' as well as 'grow cold', and will perhaps also produce heat, or some other sensible quality, in another Indivisible. The Law of Contradiction will thus be violated: for the same single Indivisible will in the same respect suffer diverse actions, or both 'act' and 'suffer action' (**26ª 14–20**).

The same argument applies in principle whatever qualities are attributed to the Indivisibles. For it is their *indivisibility* which makes it impossible to ascribe a plurality of qualities to them: and any theory, for which the ultimate Reals are Indivisibles (whether solids or planes), is open to this criticism. For that which is *indivisible* cannot contain any empty interspaces, and cannot have a plurality of constituents. Hence there can be no differences of density within an Indivisible, nor can one Indivisible be, or become, 'rarer' or 'denser' than another. Now a composite body may have many different qualities, the qualities of one composite body may differ from those of another, and a composite body may change its qualities. For one and the same composite body may have within it different degrees of density, or may change its density: and one composite body may be, or become, denser than another. But, *ex hypothesi*, there are no inner differences in the Indivisible, and no differences of stuff or texture to distinguish one Indivisible from another. Hence to suppose that an Indivisible has, or acquires, a plurality of qualities, is necessarily to violate the Law of Contradiction (**26ª 20–24**).

26ª 3. οὔτε . . . εἶναι. 'For none of them can be, e. g., either *hard* or *cold*.' Aristotle apparently selects 'hardness' and 'cold'

as examples of the *πάθη* which the Atomists cannot consistently ascribe to their Indivisibles, because (a) we should naturally have supposed that the Indivisibles *are* 'hard'; and (b) since Demokritos expressly attributes heat to the spherical Indivisibles, it seems peculiarly paradoxical that he cannot attribute cold to any Indivisible. For heat and cold are the contrasted extremes of a single quality (temperature), and what is susceptible of the one is *eo ipso* susceptible also of the other.

26ª 3–6. καίτοι . . . σχημάτων. Cf. *de Anima* 403ᵇ 31—404ª 16, 405ª 8–13; *de Caelo* 303ª 14, 306ᵇ 29—307ᵇ 18.

σχῆμα, i. q. σῶμα ἀδιαίρετον: cf. * 15ᵇ 6–9, 26ᵇ 1.

26ª 9–10. βαρύτερόν γε . . . ἀδιαιρέτων. Cf. *de Caelo* 308ᵇ 35—309ª 2: Theophrastos, *de Sensu* § 61 (Diels, p. 375) *βαρὺ μὲν οὖν καὶ κοῦφον τῷ μεγέθει διαιρεῖ Δημόκριτος*. On the vexed question as to whether, and in what sense, Leukippos and Demokritos attributed weight to their indivisible solids, see Burnet, pp. 341 ff.

26ª 10. ὥστε . . . θερμότερον, i. e., as Philoponos explains, *ὥστε, εἰ τὰ μείζω ἄτομα βαρύτερα, δῆλον ὅτι καὶ τὰ μείζω σφαιρικὰ θερμότερα*.

26ª 12. θερμόν. *ψυχρόν* EHJL: but *θερμόν* is clearly required by the argument.

26ª 14. τὸ . . . μαλακόν: cf. * 30ª 8–12.

26ª 16. ψυχρόν. *σκληρόν* EHLΦ¹: but *ψυχρόν* is required by the argument. For, on the hypothesis here made (viz. that each Indivisible possesses one 'sensible quality' in addition to its figure), the Atomists would not be bound to admit that some Indivisibles were *hard* + figured, and others *hot* + figured. On the other hand, if they attributed heat (or cold) to any Indivisible, they were bound also to attribute cold (or heat) to some other Indivisible—or, at least, so Aristotle supposes, cf. * 26ª 3.

26ª 17. οὐδὲ . . . αὐτῶν. Cf. *Phys.* 203ª 34 – ᵇ 2, *de Caelo* 275ᵇ 31–32; Burnet, p. 336₃.

26ª 20–24. τὸν . . . ἀδιαιρέτοις. For the most probable interpretation of this difficult passage, see * 25ᵇ 36—26ª 24.

We must remember that the 'sensible qualities' (the 'secondary' qualities) of the *composite* bodies are, according to the Atomists, due to the number, grouping, and turning of their constituent atoms (cf. * 15ᵇ 33—16ª 2). One and the same *composite* body possesses diverse qualities, because e. g. its atoms are concentrated in different degrees, or disposed differently, in different parts of it: i. e. because it is 'denser' or 'rarer' in different parts of its stuff.

Similarly differences of 'density', and change in degree of 'density', will serve to explain why the qualities of one *composite* body are different from those of another, and how *composite* bodies can change their qualities. But such an explanation is clearly worthless, when the supposed owner of the many qualities is an Indivisible.

τοῦτο (^{a} 21), sc. the impossible consequence—the violation of the Law of Contradiction—which was shown to follow from the supposition that e. g. a *hot* Indivisible possessed some other quality besides its heat (cf. ^{a} 18–20).

26^{a} 24–29. ἔτι . . . μικροῖς; 'It is a further paradox that there should be small Indivisibles, but not large ones. For it is natural enough, from the ordinary point of view' (νῦν, ^{a} 25), 'that the larger bodies should be more liable to fracture than the small ones, since the large bodies are easily broken up because they collide with many other bodies. But why should Indivisibility *as such*' (ὅλως, ^{a} 28, i. q. ἁπλῶς: cf. 20^{b} 30) 'be the property of small, rather than of large, bodies?'

The atoms of Leukippos and Demokritos are indivisible, because they are 'absolutely full', i. e. without interspaces. They are physically, not mathematically, indivisible (cf. Burnet, § 174). Hence 'theoretically there is no reason why an atom should not be as large as a world' (Burnet, *Greek Philosophy*, § 79), as Demokritos appears to have said: see Aetios, quoted by Diels, p. 361 l. 9. (The statement of Dionysios, quoted by Diels, p. 360 l. 35, that 'Demokritos postulated very large atoms' is probably a misunderstanding of the remark correctly reported by Aetios.) But, *in fact*, the Indivisibles were all minute—their minuteness being probably postulated by the Atomists in order to account for their invisibility (cf. 25^{a} 30).

26^{a} 29–30. μία . . . στερεῶν, as the Atomists in fact maintained: cf. the passages quoted above, * 26^{a} 17.

26^{a} 30–31. ἢ . . . ὄγκον; The alternative here suggested is that the Indivisibles form qualitatively-distinct groups, e. g. a group of fiery (i. e. spherical and therefore hot), and a group of earthy, Indivisibles. Cf. the expression τὸ σωρευόμενον μέγεθος applied above (25^{b} 22) to each of Empedokles' 'elements'.

26^{a} 34. οὐδὲν . . . προτέρου, i. e. if the substance of the Indivisibles is really uniform, the running together of drops of water is precisely parallel to the coming into contact of two or more Indivisibles.

26ª 35 – ᵇ 1. καὶ δῆλον . . . σχήματα. 'It is clear, too, that *these*'—i. e. these qualitatively-distinct sets of atoms—'ought to be postulated as "original reals", i. e. causes from which the phenomena result, rather than the "figures".' For *σχήματα*, cf. * 26ª 3–6.

26ᵇ 2. κἂν . . . πάσχοι. According to 25ª 32–34, this is precisely what Leukippos maintained. But Aristotle has shown (25ᵇ 36—26ª 3) that it follows from the conception of the Indivisible (as that which is without Void), combined with the Atomists' theory that '*πάσχειν* is impossible except through the Void', that every Indivisible must be *ἀπαθές* and *μηθενὸς ποιητικὸν πάθους*.

26ᵇ 2–6. ἔτι . . . δυνάμει. The Atomists maintain that there is an infinite multiplicity of indivisible solids moving in the Void. But this movement is inexplicable. For what sets them moving? (i) If that which moves them is other than themselves, they are *παθητικά*: but (ii) if each Indivisible sets itself moving, *either* (a) it is in fact *divisible* (into that which moves and that which is moved), *or* (b) it will unite in itself, *and in the same respect*, action and passion (moving and being moved), i. e. contraries. Hence the 'matter' of contrary properties—the *ὑποκείμενον* in which contraries inhere—will be identical-in-potentiality, as well as numerically-identical. But that is impossible: for if the *ὕλη* be identical-in-potentiality, the realization of its potentiality must be 'one'—i. e. the properties, in which the potentiality becomes actual, cannot be contraries, but must be identical.

For the general doctrine implied in ᵇ 6 (*ἡ ὕλη . . . δυνάμει*)—i. e. that the *ὕλη* is one 'numerically', but not one 'in potentiality'—cf. *Phys.* 190ᵇ 24, 192ª 1 ff.

26ᵇ 6–28. ὅσοι . . . χωρίζεσθαι: criticism of the theory which explained action–passion by pores, cf. * 24ᵇ 27–32.

26ᵇ 7. διὰ . . . κινήσεως, 'by means of the movement facilitated by the pores'. The construction of the genitive (*τῶν πόρων*) is harsh: but the meaning is clear, and there is no need to alter the text.

26ᵇ 8–10. εἰ . . . τρόπον. If the pores be not *vacua*, but full of some other body, the postulate of pores is superfluous. For if the agent can penetrate (and therefore act upon) a body under these conditions, it would be able to penetrate it equally well, if it were 'just its own continuous self', i. e. of one texture throughout. The conception of a porous body, whose pores are full of another body, is the same in principle as the theory *μὴ συνεχὲς*

εἶναι τὸ πᾶν ἀλλ' ἅπτεσθαι διῃρημένον: i. e. Aristotle is here criticizing Empedokles, cf. * 25ª 6–13.

26ᵇ 10–12. ἔτι . . . λέγουσιν; Cf. * 24ᵇ 27–32.

26ᵇ 12–13. οὔτε . . . διαφανῶν. The subject of διιέναι, as Philoponos rightly explains, is the visual ray or rays (the ὄψεις): and the ἁφαί are the points of juncture of the two bodies, i. e. the 'transparent' body itself and the body filling its pores.

26ᵇ 15–16. ἀλλὰ . . . πάλιν. Since, according to Empedokles, the pores are always full of some other body, Aristotle has maintained that the porous body is solid throughout and as impenetrable as if it were non-porous. The whole body—pores and all—is ὁμοίως πλῆρες (ᵇ 14). This criticism will still hold, even if it be objected that the pores—though they must contain a body, and thus are always full—are themselves, *qua* pores, empty channels. For even if we thus distinguish in thought between the pores and the body which fills them (even if, in this sense, the body is not as a whole ὁμοίως πλῆρες), still the body will be impenetrable, since its pores will always in fact be full.

26ᵇ 16–18. εἰ . . . ὀπηλικονοῦν. Empedokles denied that any part of the Universe was empty (cf. * 25ª 6–13): and the advocates of pores are here supposed to accept *in principle* the denial of a 'void', but to plead that the pores are *in fact* empty owing to their infinitesimal size.

26ᵇ 18. μέγα . . . ὀπηλικονοῦν, i. e. it is absurd to admit an infinitesimal 'void', and to deny that there is a big 'void', of whatever size (viz. *however small*) the 'big' may be. 'Big' is a relative term, and may include a 'void' in any degree bigger than the infinitesimal.

26ᵇ 18–20. ἢ . . . κενόν. The *term* κενόν means χωρὰ σώματος: i. e. when men dispute whether a 'void' exists, they are disputing whether there is a place *capable of receiving a body, but deprived of it* (cf. * 20ª 34 – ᵇ 2). If that is the only possible meaning of the term, it is clearly absurd to suggest that the pores are κενά if, and because, they are too small to admit a body.

26ᵇ 21–24. ὅλως . . . πεφυκότων. Action–Passion cannot be explained by pores: for even if there are pores, they can only serve to bring the agent into contact with the internal parts of the patient. If contact *on the surface* is not adequate to produce action–passion, neither will it be produced by contact *internally*: whilst if internal contact produces action–passion, why should not contact at the surface produce it?

In b 24 τῶν . . . πεφυκότων means τῶν πρὸς ἄλληλα ποιεῖν καὶ πάσχειν πεφυκότων: cf. Philoponos, whose whole note on this passage is excellent.

26b 25. οὕτως. Aristotle does not deny that there are 'channels' in bodies—e. g. the πόροι in the animals, such as the mouth, the bowels, the veins, &c.—but he does deny that bodies are perforated by infinitesimal and invisible channels, as the advocates of pores maintained.

26b 26–28. διαιρετῶν . . . χωρίζεσθαι. The sense in which every μέγεθος (and therefore also every σῶμα) is through and through divisible was discussed at length above, 16a 14—17a 17.

Aristotle's point here is that it is not necessary, in order to account for action–passion, to suppose that bodies are perforated with pre-existing infinitesimal channels. The agent can make a channel for itself in the patient, since the patient is πάντῃ διαιρετόν: and, being διαιρετόν, it can be actually divided so that its parts fall asunder—i. e. so that a channel is opened in it (b 28 δύναται χωρίζεσθαι).

A. 9

26b 29—27a 29. Τίνα . . . τρόπον. In this chapter Aristotle briefly indicates his own theory of the mechanism of ποιεῖν–πάσχειν, emphasizing its superiority both to the theory of 'pores' and to the theory of 'Indivisibles and *Vacua*'. Incidentally (27a 9–14) he criticizes the theory that a body is 'discretes-in-contact', and that action–passion takes place at the contacts.

26b 29–30. Τίνα . . . πάσχειν. The phraseology, both here and in the epilogue (27a 25–29), reminds us of the original formulation of the problem (cf. 22b 6–13) and of the connexion of the discussion of ποιεῖν–πάσχειν with the plan of the whole work: cf. * 22b 1–26.

τοῖς οὖσι is wide enough to include all possible subjects of ποιεῖν–πάσχειν, i. e. τὰ στοιχεῖα as well as τὰ ἐκ τῶν στοιχείων. On the other hand, τὰ ὄντα could not strictly be said γίγνεσθαι: hence the active aspect of γένεσις (γεννᾶν) alone is mentioned here, whereas in the epilogue (27a 26) the passive aspect (γίγνεσθαι) is mentioned too.

26b 30. ἀρχὴν . . . εἰρημένην. The principle in question is, as appears from the next sentence, that if any property *y* is predicated of any subject *x*, *x* may 'be-*y*' *either* potentially *or* actually.

26^{b} 31. τοιοῦτον : 'such-and-such', i.e. qualified by *any* quality, whatever the quality in question may be.

πέφυκεν, sc. τὸ δυνάμει τοιοῦτον.

26^{b} 33. ἧττον δὲ καὶ μᾶλλον. Γ has 'magis autem et minus', which is more logical. But the reversed order is characteristic.

26^{b} 34—27^{a} 1. καὶ ταύτῃ . . . συνεχεῖς. According to Aristotle's theory, the cold body, e. g., *qua* potentially-hot, is liable to 'suffer action' from a hot body—i. e. liable to be warmed. This susceptibility pervades the cold body throughout (because it is a consequence of its character *qua* potentially-hot) and is not restricted to parts of it or to channels within it. But though the cold body is potentially-hot throughout, its potential heat may vary in degree in different parts of it. There may be, as it were, lines or 'veins' of intense potential heat (and therefore of intenser susceptibility) in it, just as there are 'veins' in the metals, along which they are specially susceptible to action. If we are to talk of 'pores' at all, we should use the term to denote such lines of *greater* intensity and *greater* susceptibility: we must not suggest that the body is susceptible only along certain lines, and quite insusceptible in the rest of itself. Cf., for the general doctrine, * 21^{a} 5–9.

The reading of EFJ in ^{b} 34 (μᾶλλον ἢ καθάπερ) is due to a misunderstanding of the illustration. The 'veins' in the metal are not 'pores' in the sense repudiated by Aristotle. Their substance is the same as that of the rest of the metal: it is only a difference of degree.

27^{a} 1–6. συμφυὲς . . . πάσχειν. Passion implies (i) two distinct bodies: the patient must not be grown together with the agent, so as to form with it a single naturally-coherent body: (ii) contact, either immediate or mediated, between patient and agent. If the contact is mediate, the *medium* must itself be a body by nature such as to suffer action (from the agent) and to act (upon the patient).

27^{a} 6. τὸ . . . μή. Aristotle's own view (cf. * 26^{b} 34—27^{a} 1) is that a body, if παθητικόν at all, is παθητικόν as a whole, through and through. This follows necessarily from his explanation of 'susceptibility' as due to the body's possessing a property potentially. Hence any explanation of πάσχειν, which implies that the patient is susceptible only in parts of itself, must be rejected as erroneous. Now all the attempts to explain πάσχειν, which Aristotle has been criticizing, do in fact imply the view τῇ μὲν

πάσχειν, τῇ δὲ μή: for they ascribe the patient's susceptibility to peculiarities within its structure, i. e. to features belonging to parts of it, and not to a property characterizing it as a whole.

Thus (i) the Atomists explained *πάσχειν* by the *vacua* interspacing the Indivisibles: (ii) Empedokles explained it by the 'porosity' of the patient, i.e. by the hypothesis that the apparently continuous body was really 'discretes-in-contact', or was traversed by 'veins' filled with a different material (cf. * 25a 6–13): and (iii) Plato viewed the body as 'planes-in-contact', and explained *πάσχειν* by penetration and division at the contacts (cf. 25b 24–33).

27a 6–7. *διορίσαντας . . . λεκτέον.* As the text stands, we must suppose that the reference (*ἐν ἀρχῇ*) is to 24b 26 ff., where Aristotle distinguished various forms of the supposition of 'partial susceptibility'. The whole sentence (27a 6–7) would mean:—'We distinguished above the various theories of partial susceptibility, and have now to make the following remarks'.

On the whole, however, it seems more probable from the next sentence (27a 7–14) that *ἐν ἀρχῇ* refers to the elaborate discussion (16a 14—17a 17) of the sense in which every magnitude is divisible through and through. I have accordingly ventured to mark a *lacuna* before *διορίσαντας*, and to interpret the passage as follows:—'The supposition of partial susceptibility ⟨is possible only for those who hold an erroneous view concerning the divisibility of magnitudes. For us⟩ the following account results from the distinctions established at the beginning of our treatise'.

27a 7–14. *εἰ . . . ἀδύνατον.* The results established in Chapter 2 may be summarized as follows. (i) Every magnitude is divisible. There are no Indivisibles. (ii) No magnitude is *πάντῃ διαιρετόν*, i. e. no magnitude is such that 'through and through' division of it could ever actually have taken place: but (iii) every magnitude is *πάντῃ διαιρετόν*, i. e. it is always possible, given a magnitude, to divide it anywhere, though not everywhere at once. Cf. * 16a 19, * 17a 2–17.

Aristotle here presupposes and refers to these results, but his reference is brief and obscure. He makes no mention of (iii), though it expresses the truth as to the divisibility of magnitudes, presumably because this thesis would lend no support to the supposition of 'partial susceptibility'.

He argues:—(a) If there is a limit to the divisibility of the magnitude, i. e. if there are indivisible solids (as the Atomists

maintained) or indivisible planes (as Plato thought), then no composite body will be susceptible through and through: for the Indivisibles are *ἀπαθῆ* (cf. 25^{b} 36—26^{a} 3). But then no body or magnitude will be continuous: for *πᾶν συνεχὲς διαιρετὸν εἰς ἀεὶ διαιρετά* (*Phys.* 231^{b} 16).

(b) But if—as is in truth the case—the hypothesis of Indivisibles is false, and every body is divisible, there is no ground for supposing that a patient is susceptible only in parts of itself. For, when once we have recognized that there are no Indivisibles, it is clear that the opponents' description of a composite body as 'discretes-in-contact' means neither more nor less than that the body is divisible through and through.

There is no difficulty in the first part (27^{a} 7–9) of this argument: but the second part (^{a} 9–14) is most obscure. Aristotle's opponents regarded a body as discretes-in-contact, and explained *πάσχειν* by the theory that a body so constituted 'could be separated (i. e. by the agent) at the contacts' (^{a} 11–12). Now—Aristotle urges—since there are no Indivisibles, nothing is gained by describing the body as 'discretes-in-contact': all that the opponents can really mean is that the body is 'divisible' (i. e. divisible through and through). And if it is 'divisible' (or if, as they express it, 'it *can* be separated at the contacts'), then—even though it has not yet in fact been divided—it will 'be *διῃρημένον*', i.e. it will 'be in a state of dividedness' so far as is required for *πάσχειν* as they conceive it.

In 27^{a} 11 *ἢ διαιρετὸν εἶναι* must be interpreted as equivalent to *ἢ πάντῃ διαιρετὸν εἶναι*. For, since there are no Indivisibles, the parts, which are in contact, will themselves contain smaller parts in contact—and so on *ad infinitum*.

We must, I think, supply for the whole argument the suppressed corollary that, *qua πάντῃ διαιρετόν*, the body will be *πάντῃ παθητικόν*, since its susceptibility is supposed to be due to its divisibility (cf. 27^{a} 14–15).

27^{a} 8. πλάτος. We should rather have expected *ἐπίπεδον* (cf. e. g. 25^{b} 26, 29^{a} 22). The reference is no doubt to Plato.

27^{a} 12. ὥσπερ φασί τινες, e. g. Plato, cf. 25^{b} 32.

27^{a} 13–14. δυνατὸν . . . ἀδύνατον: 'for—since it *can* be divided—nothing inconceivable results if this potentiality be supposed realized.'

The argument in ^{a} 11–14 depends upon Aristotle's conception of *τὸ δυνατόν*, for which see * 16^{a} 19.

27ª 14–25. ὅλως . . . μεταβάλλοντος. All the explanations of *ποιεῖν–πάσχειν*, which Aristotle has been criticizing, imply that the patient is susceptible only in parts of itself: and this, as we have just seen, presupposes erroneous views as to the 'divisibility' of magnitudes. But, in addition to this special difficulty, the theories in question are open to a *general* criticism (ª 14 *ὅλως δὲ κτλ.*): for they assume that A can only act on B by 'splitting' it, i. e. by dividing its particles from one another. This narrow conception of *ποιεῖν–πάσχειν* is absurd, for it makes it impossible for them to recognize either Alteration or Growth and Diminution.

27ª 14. γίνεσθαι, sc. *τὸ πάσχειν.*

27ª 17. ὑγρὸν . . . πεπηγός. For this antithesis, cf. * 30ª 12–24.

27ª 18. οὐδὲ . . . διαθιγῇ: cf. * 15ᵇ 33—16ª 2.

27ª 19–21. οὔτε γὰρ . . . ὄγκους. Since the indivisible solids are *invisible* owing to their minuteness (cf. 25ª 30), it is difficult to see what right Aristotle has to make these assertions. His appeal to perception (ª 16 *ὁρῶμεν*) is irrelevant.

27ª 21. σκληρά. For the meaning of *σκληρόν*, cf. * 30ª 8–12.

27ª 23–25. οὐ . . . μεταβάλλοντος. 'For if there is to be apposition (instead of the growing thing having changed as a whole, either by the admixture of something or by its own transformation), increase of size will not have resulted in any and every part.' Cf. * 20ᵇ 34—21ª 29.

In 27ª 25 the genitive (*μεταβάλλοντος*) is at first sight perplexing. We should perhaps have expected *ἢ καθ' αὑτὸ ἢ μιχθέντος τινός*: but since the order of the alternatives is reversed, it becomes desirable to add a participle to *καθ' αὑτό*, and the added participle is naturally assimilated in case to *μιχθέντος*.

A. 10

27ª 30—28ᵇ 22. λοιπὸν . . . ἕνωσις. By the account of *μίξις* (or 'chemical combination') in the present chapter, Aristotle completes the programme which he had sketched for himself at the beginning of Chapter 6: cf. * 22ᵇ 1–26.

First, he explains the precise significance of *μίξις*, distinguishing it carefully from *γένεσις καὶ φθορά*, *αὔξησις*, *ἀλλοίωσις*, and mere *σύνθεσις* ('mechanical mixture'). If there is to be *μίξις* in the proper sense of the term, two or more distinct and separate bodies must come together so as to form a single resultant in which they are merged. The properties of the resultant must be different

from those of the constituents: and it must be uniform in its properties throughout (not merely *appear* uniform to perception) so that every part of it, however small, possesses the same properties as the whole. Nevertheless it must be possible to recover the original constituent bodies from it by a process of 'separation' or 'chemical analysis' (**27**[a] **30—28**[a] **17**).

Next, Aristotle explains the conditions under which μίξις can occur. Such a process is possible (a) because there are bodies which are naturally active and reactive, passive and re-passive, in relation to one another, and (b) because everything can *be* what it is either *potentially* or *actually*. This distinction between the *potential* and *actual* grades of a thing's *being* accounts for the temporary submergence of the properties of the constituents, and again for their re-emergence under chemical analysis of the compound (**28**[a] **18–31**).

Finally (having stated certain conditions which are specially favourable for the occurrence of the process, and having briefly considered certain exceptional instances of μίξις and explained them in terms of his general theory), Aristotle summarizes the results of the whole discussion in the form of a 'scientific' definition of 'the combinable' and 'combination' (**28**[a] **31** – [b] **22**).

The doctrine of the present chapter is briefly restated (and slightly supplemented) below: cf. * 34[b] 8–30. The reader who is interested in Aristotle's conception of μίξις should consult Alexander's περὶ κράσεως καὶ αὐξήσεως: Zabarella's *De Mistione*, *De Misti Generatione et Interitu*, *De Qualitatibus Elementaribus*: and Zabarella's commentary on the present chapter, and on *Meteorologica*, Δ. 1. By utilizing these materials, I endeavoured some years ago to give a short and accessible account of Aristotle's theory in the *Journal of Philology*, No. 57.

27[a] **30–31.** κατὰ . . . μεθόδου. Aristotle's treatment of μίξις follows the same general lines as his discussion of ἀφή (Chapter 6) and of ποιεῖν–πάσχειν (Chapters 7–9).

27[a] **31–32.** τῶν . . . ἀρχῆς. The reference is to 22[b] 1–26, which is the ἀρχή of the present investigation. Chapters 6–10, with the addition perhaps of B. 1–8, appear to constitute one of the minor treatises of which the περὶ γενέσεως καὶ φθορᾶς is composed. On the relation of such subordinate constituent λόγοι or μέθοδοι to an Aristotelian 'work', cf. Jaeger, pp. 148 ff.

27[a] **32–34.** σκεπτέον . . . ψεῦδος. From the point of view of Aristotle's general logical theory, μίξις falls under the head of

Attribute (*πάθος*). It is an 'adjectival', whose 'existence' is its inherence in something other than itself as the subject of which it is predicable or the substance of which it is a property. Its *esse* is *inesse*, its *εἶναι* is *ὑπάρχειν*. Hence the complete explanation of *μίξις* must be such as to furnish the materials from which its 'scientific definition' can be elicited. Its 'scientific definition' must specify (a) the substance or substances in which, (b) owing to a determinate proximate cause, (c) that determinate process, which the term *μίξις* properly means, must occur (cf. Introd. §§ 7–9, * $14^a 2$–3, * $20^b 34$—$21^a 29$, * $21^b 16$–17). Accordingly we shall find Aristotle claiming in the epilogue ($28^b 14$–22) that he has shown (i) *ὅτι ἔστι μίξις*, i. e. that it occurs in, or is predicable of, certain determinate substances, (ii) *τί ἐστι*, i. e. what the term properly means, and (iii) *διὰ τί*, i. e. to what precise cause its occurrence is due. And we shall find him concentrating the results of his discussion in a 'scientific definition' (cf. * $28^b 22$).

In $27^a 32$–34 Aristotle enumerates five questions for discussion. The enumeration is tentative and preliminary: and we need not attach too much importance either to the precise significance of the different questions or to the order of their enumeration. The whole matter is exhaustively discussed by Zabarella, whose interpretation I accept with one slight modification. We are to ask:— What is the meaning (1) of combination, and (2) of the combinable (*τί ἐστιν*, i. q. *τί σημαίνει*)? (3) Of what existent things is combination the attribute (i. e. what is its primary and adequate subject)? (4) What are the conditions under which combination is predicable of these things (*πῶς ὑπάρχει*, sc. *quomodo fit*—a question including the inquiry as to the proximate cause of the occurrence of *μίξις*)? (5) Does combination exist in fact, i. e. is there a distinctive subject of which combination is the distinctive and commensurate attribute?

$27^a 33 - ^b 6$. *ἔτι . . . ὄντα.* Aristotle *appears* to begin with the question enumerated last: but *in fact* (as he points out, $27^b 6$–9) his discussion concerns the meaning of the terms *μίξις* and *τὸ μικτόν*. The doubt as to the existence of combination arises, as he shows, only from misinterpretation of the term. Hence he is really opening the discussion of questions (1) and (2).

According to Aristotle's own theory, as we shall see (cf. below, B. 8), all combination in the sublunary region involves all four 'simple bodies', and results in one or other of the *ὁμοιομερῆ*: i. e. the resultant of *μίξις* is always a quaternary compound, and

the combining constituents are always Earth, Air, Fire, and Water (cf. * 14ª 19, * 21ᵇ 19–22). At present, however, Aristotle is considering the subject quite generally and assumes that every μιχθέν implies (at least) *two* μικτά or μιγνύμενα.

Now certain thinkers argued that μίξις is impossible. For we must suppose either (a) that both constituents are preserved in the compound, or (b) that both are destroyed, or (c) that one is destroyed, whilst the other is preserved. But the characteristic conditions of μίξις cannot be satisfied under any of these suppositions, although no other alternative seems possible. (a) If both constituents survive unaltered, there is no μίξις: for μίξις implies that the constituents have merged in a new resultant (cf. * 27ª 30—28ᵇ 22). (b) If both are destroyed, 'they' *are not* at all and *a fortiori* are not combined: whilst (c) if one is destroyed and the other is preserved, the two do not contribute to constitute a joint resultant. They have not 'combined', but one *is* and the other *is not.*

27ᵇ 2. ὁμοίως ἔχειν, i. e. the constituents in the supposed 'compound' are in the same condition as they were before the supposed 'combination' took place. But in ᵇ 4 ὁμοίως ἐχόντων refers to the condition of the constituents relatively to one another: i. e. 'combination demands uniformity of condition in the constituents', for both must contribute to the being of the resultant.

27ᵇ 6–10. οὗτος . . . λύοιντ' ἄν. The preceding argument rests on a misconception of the exact meaning of μίξις and τὸ μικτόν, and a consequent confusion of these terms with γένεσις–φθορά and τὸ γεννητὸν καὶ φθαρτόν. The difficulties it raises against the occurrence of μίξις will all disappear when this confusion has been cleared up. Accordingly Aristotle proceeds to discuss the precise significance of the term μίξις, and begins (27ᵇ 10–22) by eliminating certain processes which are liable to be confused with combination.

27ᵇ 10–13. ἀλλὰ . . . φθείρεσθαι. When fire burns wood, there is φθορά of the wood and γένεσις of the fire. There is no μίξις either (i) of fire and wood, or (ii) of the pieces of the wood with one another. This instance illustrates the second and third alternatives (cf. * 27ª 33 – ᵇ 6): constituents, of which *both* or *one* are destroyed, cannot be said to 'be combined'. At the same time, it prepares the way for the exclusion of αὔξησις as not μίξις proper: for the 'consumption' of food by the αὐξητικόν was compared to the 'consumption' of inflammable material by fire,

and Aristotle had suggested that the food was 'mixed' with the growing tissue (cf. 22^{a} 8–16).

27^{b} 13–17. τὸν . . . ὁρᾶται. Combination is distinguished from (i) Growth and (ii) Alteration. Growth is an illustration of the third alternative (the destruction of one constituent), and Alteration illustrates the first alternative, viz. the preservation of both constituents: cf. * 27^{a} 33 – ^{b} 6.

(i) It was only by a loose use of the term that Aristotle spoke (22^{a} 9) of the food being 'mixed' with the growing tissue. For the tissue—*qua* animated with the indwelling αὐξητικόν—'consumes' the food and converts it into its own substance: it does not co-operate with the food to produce a new resultant different in character from both.

(ii) No change of quality on the part of a body is 'combination': for both 'constituents'—viz. the body and the quality—coexist unaltered in the result. Thus, e.g., 'the shaped lump of wax', 'the whitened body', 'the learned man', are resultants of ἀλλοίωσις and not of μίξις: for the substance which is qualified, and the quality (σχῆμα, πάθος, or ἕξις) which qualifies it, manifestly both survive.

27^{b} 17–22. ἀλλὰ . . . χωριστόν. If the same substance 'combines' in itself two qualities (if e.g. a man is both ἐπιστήμων and λευκός), this coincidence of πάθη (or of ἕξις and πάθος) is not 'combination' of them: for only self-subsistents (only bodies, not their attributes) can 'combine'. Combination implies combinables which exist *per se* before the combination: but no πάθος can exist *per se*. Every πάθος is an 'adjectival', its *esse* is *inesse*: cf. * 20^{b} 17–25.

Incidentally Aristotle criticizes those philosophers who postulated a primordial 'togetherness' of all things and described this as a μῖγμα: for 'all things' would include πάθη, and these cannot 'combine'. Philoponos supposes the plural (οἱ . . . φάσκοντες) to mean οἱ περὶ Ἀναξαγόραν: but Aristotle is perhaps thinking of the 'Sphere' of Empedokles, as well as of Anaxagoras (cf. * 34^{a} 26–^{b} 2, *Phys.* 187^{a} 20–23).

27^{b} 22–31. ἐπεὶ . . . αὐτῶν. The argument (professing to show that μίξις does not in fact occur) assumed that only three alternatives are possible and urged that, whichever of these three we accept, the process is not μίξις (cf. * 27^{a} 33 – ^{b} 6). In other words, the conception of μίξις is self-contradictory: for it demands *both* that the constituents shall be merged (i.e. destroyed)

in the resultant, *and* that they shall survive (i. e. not be merged), since they are to be recoverable by analysis. Aristotle here points out that there is a *fourth* possibility, which this argument has neglected. The argument assumes that a thing must either *be* or *not-be* x: but in fact we must recognize a distinction in the grade of a thing's *being* (cf. * 26^b 30). For a thing, which *is* x, may *be-potentially* x or may *be-actually* x; and a thing, which *is-not* x actually, may nevertheless *be-potentially* x. If this distinction be applied, the conception of μίξις ceases to be self-contradictory: i. e. the different characteristics of 'combination' (or of the 'compound') are compatible with one another. Each of the constituents has, to begin with, its own distinctive character: they are, e. g., respectively actually-x and actually-y. In the process they merge in a resultant with a new character, z. Yet they have not been destroyed, but have simply sunk to a lower grade of being; i. e. they have become *potentially-x* and *potentially-y*. The character of the compound is neither x nor y, nor $x+y$; but an intermediate something, z, which participates in the characters of both constituents or results from the co-operation of both in a tempered and moderated form. And, under suitable conditions, the compound can be dissolved so that the constituents will re-emerge in their original state as *actually-x* and *actually-y*.

There are two difficulties in this passage. (i) The first is a question of fact. To what phenomena is Aristotle referring when he speaks of τὰ μιγνύμενα as δυνάμενα χωρίζεσθαι πάλιν? It seems certain from the sequel that he is thinking of the analysis of a genuine chemical compound: and therefore Philoponos is beside the mark, when he refers to the recovery of wine (from a mechanical mixture of wine and water) by filtering (cf. p. 191, φασὶ γοῦν διὰ τῶν καλουμένων ἐν τῇ συνηθείᾳ στρατιωτῶν ποταμοῦ διηθούμενον τὸν κεκραμένον οἶνον διακρίνειν τοῦ ὕδατος τὸν οἶνον). Yet what facts of chemical analysis were known to Aristotle? Or is he relying upon some of the phenomena of putrefaction?

(ii) The second difficulty is one of interpretation. In what precise sense are the constituents preserved *potentially* in the compound? What is meant by the statement (^{b} 25–26) that 'each of them may still *be-potentially* what it was before they were combined', and again by the phrase (^{b} 30–31) σώζεται γὰρ ἡ δύναμις αὐτῶν?

Readers of Aristotle are familiar with two senses in which

a thing is said to 'be-potentially *x*'. Thus (i) a student of geometry is *δυνάμει γεωμέτρης* when he is acquiring, but has not yet mastered, the *ἕξις* of geometrical demonstration: and (ii) the geometer is *δυνάμει γεωμέτρης* when he is not actually solving a geometrical problem. In sense (i), the *δύναμις* is contrasted with the *ἕξις* into which it may develop: in sense (ii), the *ἕξις* is contrasted with the *ἐνέργεια* (the *θεωρία*) in which it is actualized (cf. e.g. *de Anima* 417^a 22 ff., and often). But—as Philoponos and Zabarella rightly observe—the constituents are not preserved *δυνάμει* in the compound in either of these senses. *Not in the first sense*: for, *ex hypothesi*, before they combine, they are already actually-*x* and actually-*y*, whereas the student is not actually a geometer, but only on the road to become one. *Nor in the second sense*: for, *ex hypothesi*, the constituents have lost their distinctive natures in the compound and have co-operated to produce a resultant with fresh properties of its own. But the geometer does not lose his *ἕξις* when he is not *θεωρῶν*.

Philoponos (p. 188) compares the state of the constituents in the compound to that of the geometer who is trying to solve a problem when drunk—*ἐνεργεῖ μὲν κατὰ τὴν ἕξιν, οὐκ εἰλικρινῶς δέ*. The constituents, he thinks, retain their distinctive 'powers of action' in a diminished and tempered degree—*κεκόλασται γὰρ ἡ αὐτῶν εἰλικρινὴς ἐνέργεια, καὶ οὐκ ἔστιν οἷαπερ ἦν πρὶν μιχθῆναι*. This interpretation is endorsed by Zabarella (the constituents are 'non penitus corrupta, sed solum refracta et labefactata') and it is confirmed and further explained below, 28^a 28–31 (cf. * 28^a 29) and 34^b 8–30. Cf. also *Journal of Philology*, No. 57, pp. 81–6: and below, 33^a 28 and 32.

27^b 26. *καὶ οὐκ ἀπολωλότα*, sc. *ἐνδέχεται τὰ μιχθέντα εἶναι*. Ought we perhaps to read *ἀπολωλότων*?

27^b 31—28^a 18. *διὸ . . . πάλιν*. The first problem with its difficulties has now been solved. The meaning of *μίξις* has been explained, and the explanation has dispelled all doubts as to its occurrence. The constituents survive in the compound, for their 'merging' is simply a lowering of their grade of being: and they can 're-emerge', for they can recover their original fullness or actuality of being. It is not a passage from being to nonentity, and a return from nothing to something. It is merely a change from more to less, and from less to more, a lowering and a heightening of the degree of being.

We proceed therefore to the discussion of the problem im-

mediately connected with these difficulties as to the mode of survival of the constituents (^{b}31 *τὸ . . συνεχὲς τούτοις ἀπόρημα*). This is formulated in a way which assumes that *μίξις* (combination) is only a special case of *σύνθεσις* (mechanical mixing). 'Is combination', Aristotle asks (^{b}32–33), 'something relative to perception', i. e. is it distinguished from *σύνθεσις* merely by the limitations of our vision? The question is developed by bringing out the alternatives which it implies (^{b}32 *διαιρετέον*, cf. *14^{a}2–3), thus:—(i) Is there *μίξις* when the constituents have been divided into parts no longer distinguishable by our vision and when every such part of one constituent is juxtaposed to a corresponding part of the other constituent? Or (ii) does *μίξις* require division of the constituents into *ultimate least* parts, and must every minimal part of one constituent be juxtaposed to a minimal part of the other?

Both these alternatives are then rejected by Aristotle (28^{a}5–17), and the complete otherness of *μίξις* and *σύνθεσις* is emphasized. He is consequently obliged to discuss 'once more' (28^{a}18 *πάλιν*) *πῶς ἐνδέχεται γίγνεσθαι ἡ μίξις*. In other words the problem raised at 27^{b}32–33 is really the question *πῶς ὑπάρχει* (or *πῶς ἐνδέχεται γίγνεσθαι*) *ἡ μίξις*: and the solution (28^{a}18 ff.) involves the determination of the precise character of the combinables, i. e. (*inter alia*) the exhibition of those features in the combining bodies which are the proximate cause of their combination (cf. *27^{a}32–34).

27^{b}33—28^{a}17. *ὅταν . . . διαιρεθῆναι.* This passage is unfortunately obscure, partly owing to difficulties of reading and partly owing to its compression. Aristotle's treatment of a similar problem (the *μίξις* of colours) in the *de Sensu* (439^{b}19—440^{b}23) is, if anything, more obscure than the present passage (to which he refers at 440^{b}3, 13), and it throws very little light on the discussion here.

The two views of *μίξις* (*see preceding note*), which Aristotle here puts forward for criticism, agree in recognizing no difference of principle between *μίξις* and *σύνθεσις*. According to both of them, *μίξις* is a mechanical mixing or a shuffle, and not an interpenetration or a fusion, of the constituents. According to both, therefore, *μίξις* is *πρὸς τὴν αἴσθησίν τι* (27^{b}33), though Aristotle speaks as if this were true only of the first view; for, according to both, the resultant is not really, but only appears to be, a homogeneous compound. An ideally acute vision would discern the different constituents in the whole, and would see that they are juxtaposed,

not fused. The difference between the two views is one of degree. *According to the first*, the constituents have been divided into units, which our vision does not discriminate, but which are not supposed to be ultimate atomic parts. Thus we should speak of a μίξις of wheat and barley, if each grain of wheat were juxtaposed to a grain of barley ($28^a 2$–3). But, *according to the second*, the constituents have been divided into ultimate parts—i. e. into atoms ; and each atom of one constituent has been juxtaposed to an atom of the other. Aristotle urges *against both views* that the resultant is not ὁμοιομερές, i. e. that the constituents are not merged in a new product, but simply shuffled to form an aggregate. And he urges *against the second view* that it assumes (what he has proved to be untenable) that a body can be divided into atomic parts.

His main contention is that μίξις proper is *in principle* distinct from σύνθεσις. For τὸ μιχθέν must be ὁμοιομερές, whereas τὸ σύνθετον differs in quality in different parts of itself, since its components are not fused, but merely aggregated. The reader will observe that μίξις, as Aristotle conceives it, demands a more thorough union of the constituents than that assigned to the constituents of a chemical compound by modern chemical theory. In so far at least as modern chemistry regards a compound as a mere re-arrangement or shuffle of the atoms of the combining constituents, Aristotle would accuse it of confusing μίξις with σύνθεσις. Any such theory falls under the *second* of the two views which Aristotle here attacks.

$27^b 33$–35. ὅταν . . . αἰσθήσει. οὕτως ($^b 33$) and τοῦτον τὸν τρόπον ($^b 34$) are *both* antecedents of ὥστε ($^b 35$). The parts must be smaller than the *minima visibilia*, and they must be so juxtaposed as to be individually indiscernible.

$28^a 1$–2. ἢ . . . μιχθέντων ; 'Or ought we to say "No: but they have been combined when the result is such that *any and every* part of one constituent is juxtaposed to a part of the other"?'

I have ventured to read ἀλλ' ⟨ὅτε⟩ ἔστιν ὥστε . . .

For the two views here in question, see $^*27^b 33$—$28^a 17$. According to *the first*, the supposed μιχθέν is really a σύνθετον in which small pieces of one constituent alternate with small pieces of the other: and the small pieces—though *we* cannot discern them—retain the characters of the whole constituents (cf. $28^a 7$ σωζόμενα). According to *the second* view, the supposed μιχθέν

is really a *σύνθετον* in which *the atoms* of one constituent alternate with *the atoms* of the other—the atoms being indiscernible even to an ideally-acute vision.

The *first* view—to judge by Aristotle's illustration (28ª 2–3)—is merely a popular view implied in the common use of the term *μίξις* in everyday life. Alexander (*περὶ κράσεως καὶ αὐξήσεως*, ed. Bruns, p. 214) is mistaken in attributing it to Demokritos. The *second* view, as Philoponos rightly says, is that of Demokritos. If Alexander (l. c) is right in attributing a view of this kind to Epikouros, we must suppose that here—as in other respects—Epikouros made no real advance on Demokritos.

28ª 2–3. **λέγεται . . . τεθῇ.** Zabarella insists that we must suppose the wheat and barley to have been ground to powder, as otherwise the particles would not be indiscernible to sense: and Philoponos (p. 192, l. 26) paraphrases *ὥσπερ εἴ τις σεμίδαλιν λεπτὴν ἐκ πυρῶν μίξει ἀλεύρῳ κριθῆς*. But the only natural interpretation of *ἠτισοῦν παρ' ὁντινοῦν* is to suppose that the single grains are shuffled, and this is confirmed by *de Sensu* 440ᵇ 4–6. In such a shuffle the single grains would not be 'discernible to vision', unless they were separated from the mass: and this is all that Aristotle means.

28ª 3–5. **εἰ . . . παρ' ὁτιοῦν.** 'But every body is divisible and therefore, since body combined with body is uniform in texture throughout, *any and every* part of each constituent ought to be juxtaposed to a part of the other.'

The compound resulting from *μίξις* is uniform in texture, i. e. each of its minutest parts must exhibit the same character as the whole. If, then, *μίξις* is a shuffle, it is illogical to stop the division of the constituents at e. g. the single grains of wheat and barley. For the compound is divisible *ad infinitum* (since *every* body is divisible): and yet each of its minutest parts must contain a part (or parts) of both constituents. The only logical view, therefore, is the *second* one: viz. that the compound is a mosaic of *the atoms* of its constituents. This, of course (as Aristotle will point out immediately), is in the end impossible: for, since *every* body is divisible, there are no atoms.

For *μικτόν* (ª 4), i. q. *μιχθέν*, cf. e. g. 34ᵇ 31.

28ª 5–17. **ἐπεὶ . . . διαιρεθῆναι.** Aristotle lays down two theses: (i) Composition is quite other than combination, and (ii) No body can be divided into least, i. e. not further divisible, parts. It follows (a) that combination is not the juxtaposition of little *x*'s

and little *y*'s, small pieces of the constituents *x* and *y* (*the first view must therefore be rejected*); and (b) that the juxtaposition of atoms of *x* and *y* is impossible (i.e. *the second view is untenable*).

The whole is one sentence, including a long parenthesis (ª 8–15 σύνθεσις . . . μεμιγμένον). The οὔτε of ª 15 corresponds to the οὔτε of ª 7.

28ª 8. κρᾶσις. Strictly speaking, κρᾶσις is that species of μίξις in which the constituents are liquids: cf. *Topics* 122ᵇ 25–31; *Journal of Philology*, No. 57, p. 73. But Aristotle does not consistently employ κρᾶσις in this restricted sense: in ª 12, e.g., τοῦ κραθέντος is equivalent to τοῦ μιχθέντος. Moreover, in the end *only* liquids, or things *qua* liquefied, can combine: cf. * 28ª 24.

28ª 9–10. οὐδ' ἕξει . . . μόριον. The character of the compound depends upon the proportion in which its constituents are combined (* 14ª 19): and since the compound is ὁμοιομερές, the constituents must be present in the same proportion in every part of it as in the whole.

The amounts of Earth, Air, Fire, and Water must be *proportionally* identical (e.g.) in a lump of flesh and in the minutest particle of the lump. But this condition would not be satisfied if μίξις were what the advocates of the *first* view suppose.

28ª 14–15. καὶ . . . οὐθὲν μεμιγμένον. Aristotle was going to say 'the same thing will be combined to the short-sighted percipient, and not combined to the man with acute vision': but he substitutes τῷ Λυγκεῖ δ' οὐθὲν μεμιγμένον ('to the eye of Lynkeus nothing will be combined') for the second clause, thus producing a slight anacoluthon.

H reads λυγγεῖ (i.q. λυγκεῖ, the dative of λύγξ): but I can find no evidence that Aristotle credited the lynx with sharp sight.

28ª 18. πάλιν. Cf. * 27ᵇ 31 – 28ª 18. Bonitz (*Ind.* 559ᵇ 18) is, I think, mistaken in quoting this passage as an example of the use of πάλιν to mark the next step in the argument (cf. * 24ᵇ 25).

28ª 18–31. ἔστι . . . κοινόν. Aristotle's own account, which is here given, involves answering the questions:—(i) What is the primary commensurate subject of which μίξις is predicable? (ii) What is the proximate cause of the occurrence of μίξις? (cf. * 27ª 32–34).

(i) The things of which μίξις is commensurately predicable—the 'combinables'—must be (a) reciprocally active and reciprocally passive bodies, which (b) are easily-divisible, and (c)

are present in such amounts that their 'powers of action' are more or less balanced. If these conditions are satisfied, the combinables will produce, reciprocally in one another, (ii) that kind of ἀλλοίωσις which is the proximate cause of the 'unification' called μίξις. The ἀλλοίωσις in question is a reciprocal tempering of the distinctive qualities of the combinables such that a new substance emerges, whose qualities are a compromise between the qualities of the constituents (cf. * 27^{b} 22–31).

28^{a} 18–23. ὥς φαμεν . . . σώμασιν. Cf. e. g. * 24^{a} 24 – ^{b} 22, * 24^{a} 34 – ^{b} 1, * 24^{b} 13–18. Since ἰατρική and ὑγίεια do not share in the ὕλη of bodies, they cannot 'act upon' and reciprocally 'suffer action from' the latter: hence they do not heal the patient by *combining* with his body.

28^{a} 24. εὐδιαίρετα. Since, as we shall see (28^{b} 1–2), τὰ εὔριστα are most easily divided, and since τὰ εὔριστα are equivalent to τὰ ὑγρά, it follows that τὰ ὑγρά are the 'most combinable' of bodies. In the end, it is liquids that combine; or at least the presence of moisture is a *conditio sine qua non* of combination. The metals, e. g., have first to be liquefied (molten), in order to combine: cf. Alexander, περὶ κράσεως καὶ αὐξήσεως, p. 230, ll. 34 ff.

28^{a} 24–25. πολλὰ . . . συντιθέμενα: 'if a great quantity, or a large bulk, of one of these is brought together with a little, or with a small piece, of another . . .'

But Aristotle's usage does not consistently support any clear distinction between the antitheses πολύ–ὀλίγον and μέγα–μικρόν: cf. my note on *de Lin. Insec.* 968^{a} 4.

28^{a} 26. μεταβάλλει . . . κρατοῦν. Cf. Alexander, l.c., p. 230, ll. 5–12.

28^{a} 29. ταῖς δυνάμεσιν. Cf. *27^{b} 22–31, 33^{a} 28 and 32; Alexander, l. c., p. 230, ll. 29–30 διὰ τὴν τῶν δυναμένων [*l.* δυνάμεων] ἰσότητα καθ' ἃς ποιεῖ καὶ πάσχει . . .

28^{a} 29–31. τότε . . . κοινόν. Each of the constituents, *qua* active, is 'dominant' relatively to the other *qua* passive. Neither of them is *absolutely* dominant. Hence each of them is drawn out of its own nature towards the nature of the other: but neither of them becomes the other. Each meets the other half-way, and the resultant is a compromise between them.

28^{a} 31–33. φανερὸν . . . παθητικά. Cf. Alexander, l. c., p. 229, ll. 8–11. Aristotle is assuming the results of his discussion of action–passion in A. 7.

28^{a} 34. ῥᾷον . . . μεθιστᾶσι. Contact is required for action–passion (cf. * 23^{a} 12–22). Hence, since division of the con-

stituents facilitates their thorough contact, it facilitates their action-passion and therefore their combination.

28ª 35 – ᵇ 1. διὸ . . . μικτά. 'Hence, amongst the divisible susceptible materials, those whose shape is readily adaptable have a tendency to combine.'

διαιρετῶν, i. q. *εὐδιαιρέτων* (so also below, ᵇ 4).

28ᵇ 2. ἦν. Bonitz (*Ind.* 98ᵇ 17) interprets *ἦν* as a reference to *de Caelo* 313ᵇ 8. But the imperfect is idiomatic: 'that is precisely what *τὸ εὐορίστῳ εἶναι* means'. Cf. e. g. * 14ᵇ 25–26, 31ᵇ 23, and Bonitz, *Ind.* 220ª 45.

28ᵇ 3–4. οἷον . . . διαιρετῶν. *τὸ ὑγρόν* is defined as 'that which, being readily adaptable in shape, is not determinable by any limit of its own': cf. * 29ᵇ 30–32.

28ᵇ 4. γλίσχρον. On the contrariety *γλίσχρον-κραῦρον*, see * 30ª 4–7. Instances of *ὑγρά*, which are *γλίσχρα*, are oil (30ª 5–6, *Meteor.* 382ᵇ 16), pitch (*Meteor.*, ib.) and bird-lime (*ἰξός*, *Meteor.* 385ᵇ 5). On the whole, 'viscous' fairly represents the meaning. A substance, whether *soft-solid* or *liquid*, is *γλίσχρον*, when it is extensible (*ἑλκτόν*), instead of falling readily asunder into drops or small particles (cf. *Meteor.* 387ª 11–15).

28ᵇ 5–14. ταῦτα . . . ἑτέρων. Aristotle calls attention to two typical cases of imperfect combination, of which the first is not properly-speaking 'combination' at all.

(i) If one constituent is a viscous liquid, it increases the volume and bulk, but otherwise produces no change. Thus, oil and water do not 'combine': the result is a mere admixture which is 'thicker' or 'coarser' than both the constituents (*Meteor.* 383ᵇ 20–28).

(ii) If one only of the constituents is *παθητικόν*—or is superlatively *παθητικόν* relatively to the other (*ἢ σφόδρα τὸ δὲ πάμπαν ἠρέμα*)—the *insusceptible* constituent 'takes it up' with little or no increase of its own bulk. The *susceptible* constituent disappears, i. e. is entirely absorbed by the other. The only trace of its presence is a change of colour in the *insusceptible* constituent.

Thus bronze 'takes up' tin, the only apparent effect being a whitening of the bronze. This is to be regarded as a somewhat equivocal case of combination. The bronze and the tin behave towards one another partly as 'combinables' and partly as 'matter' and 'form':—they falter and hesitate, as it were, which attitude to adopt.

28ᵇ 12–13. ὁ γὰρ . . . μόνον. According to Kopp (*Geschichte*

der Chemie, iv, p. 113) χαλκός is used to denote both copper and brass (i. e. an alloy containing two-thirds copper and one-third zinc). Kopp (l. c., iv, pp. 125 ff.) is uncertain what is meant by κασσίτερος in Homer and Herodotos, but suggests that the Κελτικὸς κασσίτερος (referred to in *de Mir. Auscult.* 834ª 6) is an alloy containing tin.

I have translated χαλκός 'bronze' (which contains ten parts of tin to ninety parts of copper), and κατττίτερος 'tin', because this seems to suit the phenomenon here described: cf. Roscoe, *Lessons in Elementary Chemistry*, ed. 1882, p. 155.

Aristotle recognizes two main classes of ὁμοιομερῆ, viz. (i) those which belong to animate nature, to plants and animals (e. g. ξύλον, φλοιός, σάρξ, ὀστοῦν, νεῦρον, δέρμα), and (ii) those which belong to inanimate nature. The latter are usually grouped together as τὰ μεταλλευόμενα, but they include (a) the metals proper (e. g. gold, iron, silver), and (b) τὰ ὀρυκτά, e. g. 'the insoluble kinds of stones' and σανδαράκη, ὤχρα, μίλτος, θεῖον (? = red sulphate of arsenic, ochre, ruddle, sulphur). The reader will remember that the heat of the sun draws from the earth and the waters on the earth a 'twofold exhalation' (cf. * 22ᵇ 2–3), which is partly 'hot–dry' and partly 'hot–moist'. This plays a part in the formation of the ὁμοιομερῆ of inanimate nature. For it gets imprisoned in particles of the earth: and thus, *qua* predominantly 'hot–dry', contributes to the formation of τὰ ὀρυκτά, and *qua* predominantly 'hot–moist' (particularly when imprisoned in stones, whose dryness compresses and solidifies it) gives rise to the metals. When metals liquefy with heat, this is the setting free of the moisture belonging to the exhalation which contributed to their formation. Cf. *Meteor.* 378ª 12 – ᵇ 4, 384ᵇ 30–34.

28ᵇ 12. ὡς . . . χαλκοῦ. ἄνευ ὕλης is used adjectivally, and is equivalent to the un-Aristotelian ἄϋλον: cf. * 22ª 28–33.

28ᵇ 20. ἀλλ'. The adversative is used, because the definitions of the combinable and combination, which follow, show that the combinable need neither be destroyed nor preserved unaltered, and that combination is neither composition nor relative to perception.

28ᵇ 21. ὁμώνυμον. We should have expected συνώνυμον: for the combinable is combinable with a contrasted species of the same genus, i. e. a contrary information of the same ὕλη. Cf. * 14ª 20, * 22ᵇ 29–32. But Aristotle does not always use ὁμώνυμον in the technical sense in which it is contrasted with συνώνυμον. He

sometimes uses it in its ordinary significance to mean merely that 'A has the same name as B', without implying that the nature expressed by the name differs in A and B: cf. Bonitz, *Ind.* s. v.

The meaning here is that *τὸ μικτόν* is relative to something else which in that relation must also be called *μικτόν*.

28b 22. *ἡ . . . ἕνωσις.* Combination is that kind of unification of 'combinable' substances (i. e. substances fulfilling the conditions specified in the definition of the 'combinable') which must occur in so far as they have reciprocally 'altered' one another's qualities in the manner explained.

In this 'scientific definition' of *μίξις* (cf. * 27a 32–34), *ἕνωσις* is the genus of which *μίξις* is a species. The generic *πάθος* (*ἕνωσις*) is specified, or rendered determinate, by the proximate cause (*ἀλλοιωθέντων*) which necessitates its inherence in its commensurate subject (*τῶν μικτῶν*).

B. 1

28b 26—35a 23. *Περὶ . . . εἴρηται.* On the connexion of this section (B. 1–8) with the plan of the work as a whole, see * 22b 1–26.

It will be remembered that Aristotle propounded two main questions concerning 'the so-called elements':—viz. (i) Are Earth, Air, Fire, and Water *really* 'elements'? And, if not, (ii) Do they all come-to-be in the same manner, reciprocally out of one another: or is one amongst them relatively primary, the others being derivative forms of it? (cf. * 22b 2–3, * 22b 3–4). Aristotle answers the *first* of these questions in B. 1–3, where he maintains that Earth, Air, Fire, and Water are not really 'elements', i.e. not eternal and unchangeable. They are changing informations of *πρώτη ὕλη*, distinctively characterized by qualities which belong to certain primary contrarieties. Strictly speaking, *πρώτη ὕλη* and the *ἐναντιώσεις* are the real 'elements', i. e. the eternal elementary conditions of *γένεσις* and *φθορά*. Earth, Air, Fire, and Water are 'primary' and 'simple' *bodies* (for a qualification of this statement, see * 30b 1–7, * 30b 22): but, as *bodies*, they presuppose *πρώτη ὕλη* and the *ἐναντιώσεις* as their *στοιχεῖα*.

The *second* question is answered in B. 4. None of the 'simple bodies' is prior to the others. They all come-to-be out of one another. They are phases in a cycle of transformations through which *πρώτη ὕλη* passes.

In B. 5–7 Aristotle's doctrine of the 'simple bodies' is con-

firmed and further explained. Thus, in B. 5 it is restated, and Aristotle proves that no 'simple body' can be an *ἀρχή* of the others: in B. 6 Empedokles' general theory of the 'elements' is criticized: and in B. 7 Aristotle explains how the *ὁμοιομερῆ* come-to-be out of the 'simple bodies' by combination—a point left quite inexplicable by Empedokles.

Finally, in B. 8 Aristotle establishes that every *ὁμοιομερές*—and therefore (in the end) every composite natural substance in the sublunary world—consists of all four 'simple bodies' as its material constituents.

28^{b} 27. *πῶς . . . φύσιν.* We must identify *τὰ μεταβάλλοντα κατὰ φύσιν* with the *φυσικὰ σώματα* of the Lower Cosmos, i. e. with *τὰ γεννητὰ καὶ φθαρτά.* For though contact is predicable of *τὰ μαθηματικά*, Aristotle restricted his discussion to *ἀφὴ ἡ ἐν τοῖς φυσικοῖς.* And though the heavenly bodies, *qua* possessing an immanent source of movement, are *φυσικὰ σώματα*, Aristotle's discussion in A. 6 was primarily concerned with *reciprocal* contact, whereas the contact of the *οὐρανός* and the Lower Cosmos is one-sided (cf. * 22^{b} 2–3, * 22^{b} 32—23^{a} 34). Contact therefore, as defined in A. 6, is a *πάθος* of the changing natural bodies within the sublunary world, i. e. of *τὰ γεννητὰ καὶ φθαρτά*: and the same restriction applies to action–passion and combination.

28^{b} 28–29. *ἔτι . . . αἰτίαν.* Aristotle is referring to A. 1–3, and particularly to A. 3. *Unqualified* *γένεσις* and *φθορά* are *substantial* coming-to-be and passing-away, as distinguished from change of *πάθος*, i. e. change in any Category other than that of Substance (cf. * 17^{a} 32–34): and the 'cause', which Aristotle claims to have explained, is *πρώτη ὕλη* (cf. * 18^{a} 25–27).

28^{b} 29–31. *ὁμοίως . . . αὐτῶν*: cf. 19^{b} 6—20^{a} 7, with the notes. *αὐτῶν*, sc. *γενέσεως καὶ φθορᾶς τῆς ἁπλῆς.* It is noticeable, as Zabarella points out, that Aristotle makes no mention of his discussion of *αὔξησις* in the present summary of the first book. As we saw (* 20^{a} 8), *αὔξησις* is a *πάθος* of the *ἔμψυχα* only: and though the discussion of it is germane to the subject-matter of the present work, its inclusion is not absolutely necessary.

28^{b} 31–32. *λοιπὸν . . . σωμάτων.* *λοιπόν*, 'reliquum est, i. e. sequitur' (Zabarella). The discussion of 'the so-called elements' does not complete Aristotle's task, for he has still to treat of the causes (especially the efficient and final causes) of *γένεσις* and *φθορά.* If we are to press the meaning of *λοιπόν*, we must suppose that the ensuing discussion of the 'elements' is 'what remains'

in order to fulfil the plan which was sketched at 22b 1–5. Cf. * 27a 31 : and, for a similar use of λοιπόν, cf. * 20a 8.

The construction of θεωρῆσαι with περί and the accusative is unusual. Bonitz (*Ind.* 328b 33) professes to quote two instances, but *the first* (*Metaph.* 1027b 28) is not an instance at all, since θεωρῆσαι has an object, and *the second* (*Polit.* 1325b 34) is hardly parallel to the present passage. Philoponos feels the difficulty, but neither of the solutions, which he suggests, will do. We must, I suppose, account for the accusative as due to the desire of avoiding the ugliness and obscurity which the genitive would here entail.

τὰ καλούμενα στοιχεῖα τῶν σωμάτων might mean 'illa ex corporibus quae vocantur elementa'. But Zabarella seems to be right in interpreting the phrase as 'quae vocantur elementa aliorum corporum'. For τὰ καλούμενα στοιχεῖα, see * 22b 1–2.

28b 32—29b 6. γένεσις . . . τοσαῦται. Aristotle proceeds to summarize and to criticize the erroneous views of his predecessors concerning 'the four simple bodies' (28b 32—29a 24). He then states his own theory in outline (29a 24 – b 6). All perceptible bodies presuppose Earth, Air, Fire, and Water: but these themselves presuppose, as their elementary 'constitutive moments', πρώτη ὕλη and certain ἐναντιώσεις (cf. * 29a 24 – b 3). What these ἐναντιώσεις are, is explained in the next chapter.

28b 32–33. γένεσις . . . τούτων. Zabarella (who professes to follow Aquinas and Averroes) interprets αἱ φύσει συνεστῶσαι οὐσίαι as 'corpora mista' (i. e. τὰ ὁμοιομερῆ), τὰ αἰσθητὰ σώματα as 'elementa', and τούτων as τῶν φύσει συνεστωσῶν οὐσιῶν.

But the antecedent of τούτων must surely be 'the perceptible bodies': there is no reason to restrict the latter to 'the so-called elements': and the phrase αἱ φύσει συνεστῶσαι οὐσίαι includes much more than the ὁμοιομερῆ.

Thus e. g. in the *Metaph.* (1042a 6–11) Aristotle enumerates certain things 'which everybody admits to be substances'. These are αἱ φυσικαὶ οὐσίαι, and they fall into three groups:— (i) 'Fire, Earth, Water, Air and any other simple bodies' (τἆλλα τὰ ἁπλᾶ σώματα). With this group we are not concerned, since the οὐσίαι here in question are not 'simple', but the products of natural processes which have brought, and hold, together a plurality of constituents (φύσει συνεστῶσαι): (ii) 'the οὐρανός and its μόρια', i. e. the heavens, their component spheres and the heavenly bodies which are set in these (cf. e. g. Alexander

on the *Meteorologica*, ed. Hayduck, p. 4, l. 24). With these again we are not concerned; for they are *ἀγένητα* and *ἄφθαρτα*, whereas Aristotle is here speaking only of those substances of which *γένεσις* and *φθορά* are predicable: finally, (iii) 'the plants and the animals, and the *μόρια* of both'. It is these—the organic things in nature and their *μόρια*—to which Aristotle is referring primarily, if not exclusively. The *μόρια* include (a) the *ἀσύνθετα μόρια*, i. e. the *ὁμοιομερῆ*: and (b) the *σύνθετα μόρια*, or the *ἀνομοιομερῆ*, each of which is composed of two or more different *ὁμοιομερῆ*. Thus the *μόρια* of animals include (i) 'the tissues'—flesh, blood, bone, &c.—(ii) 'the organic parts'—e. g. hand, leg, heart, eye—and (iii) 'parts' like the head, the face, &c. (cf. e. g. *Hist. Anim.* 486^{a} 5–14, *de Part. Anim.* 640^{b} 17–22).

Although the *ὁμοιομερῆ* are *ἀσύνθετα* (i. e. not composed of two or more *aggregated* different constituents), they are not 'simple', but chemical compounds. The four 'simple bodies' have fused and coalesced to form them. Hence they are *φύσει συνεστῶτα*, and are included in the *οὐσίαι* of which Aristotle is here speaking. (For the application of *συνίστασθαι* to the *ὁμοιομερῆ*, cf. e. g. *Meteor.* 384^{b} 30 ff., 389^{b} 25.) It is possible—though on the whole perhaps improbable—that Aristotle intends the phrase (*αἱ φύσει συνεστῶσαι οὐσίαι*) to cover also the *ὁμοιομερῆ* of inanimate nature, cf. * 28^{b} 12–13.

Now the organisms and their 'parts' are through and through characterized by the soul or life which is their 'form' (cf. * 21^{b} 19–22). What comes-to-be, in the *γένεσις* of a plant or an animal or of any of their *μόρια*, is a *living*-body, a *living*-tissue, or a *living*-organ: and the essential and distinctive feature in this phenomenon is the emergence of a new soul or life, or the emergence of a new tissue or organ *qua* contributory to a new life. Nevertheless this *γένεσις* is not the coming-to-be of soul *bare*, but the coming-to-be of an *ἔμψυχον σῶμα*. Its indispensable condition is always the coming-to-be of a new 'perceptible body'—i. e. the development of certain perceptible bodily materials to that grade of complexity at which they are the appropriate matter to be informed by *this* soul. Hence Aristotle says here that the *γένεσις* (or the *φθορά*) of every one of the *φύσει συνεστῶσαι οὐσίαι* implies, as its *conditio sine qua non*, the *αἰσθητὰ σώματα*. The foundation of all the birth and death in the organic world is the *γένεσις* and *φθορά* of the *αἰσθητὰ σώματα* (cf. e. g. *de Caelo* 298^{b} 3 *πᾶσαι γὰρ αἱ φυσικαὶ οὐσίαι ἢ σώματα ἢ μετὰ σωμάτων γίγνονται καὶ μεγεθῶν*).

The birth and the death of the organic substances and their constituent parts (so perhaps we may paraphrase Aristotle's doctrine) are not the emergence and the disappearance of immaterial 'forms'. These substances are embodied-souls or forms-in-matter; and we cannot understand their *γένεσις* or their *φθορά*, unless we study the *γένεσις* and the *φθορά* of their matter. For their matter is 'the perceptible bodies', i. e. a matter itself 'informed', itself the product of development, presupposing more elementary conditions for its emergence. What we have to do, therefore, is to trace the lower stages of that development which culminates in the emergence of the organic substances. We must discover what are the *ἀρχαί* of the *αἰσθητὰ σώματα*, i. e. from what primary material and formal conditions they result. Aristotle, as we shall see, reduces all *αἰσθητὰ σώματα* in the sublunary world to Earth, Air, Fire, and Water, or to compounds and composites of these; and regards Earth, Air, Fire, and Water themselves as resultants of *πρώτη ὕλη* and the two primary *ἐναντιώσεις*.

328^b 33—329^a 5. τούτων . . . πράγμασιν. For a similar brief classification, cf. * 30^b 7–21.

The common and erroneous assumption of all the theories here quoted is that the underlying material, of which the perceptible bodies are made, *is itself a body* (or *bodies*) *having separate existence*. Thus, e. g., Anaximenes and Diogenes assumed Air as the underlying matter, Herakleitos and Hippasos Fire, Anaximander a *body* (28^b 35) intermediate between Fire and Air: Parmenides (cf. * 18^b 6–7, * 30^b 13–19) assumed Fire and Earth, Ion Fire, Earth, and Air, and Empedokles Fire, Earth, Air, and Water. The perceptible bodies *ought* (cf. * 14^a 6 – ^{b} 8) to be derived by 'alteration' from the 'underlying matter' if it is a single body, by 'association and dissociation' if it is two or more bodies. But *in fact* the pluralists employ both methods of derivation (29^a 3–5; cf. A. 1 and the notes).

28^b 35. ἤ τι μεταξὺ τούτων. Aristotle is thinking of Anaximander: cf. * 32^a 20–25.

29^a 1–2. οἱ δὲ . . . τρίτον. Philoponos attributes this view to the poet Ion of Chios (cf. Diels, pp. 220–222). Aristotle refers to it again below: see * 30^b 15–17.

29^a 5. ἀρχὰς καὶ στοιχεῖα: 'originative sources, i. e. elements'. The term *στοιχεῖα* is restricted to *immanent ἀρχαί* (the *immanent* originative sources of a thing's being), i. e. to *ὕλη*, *εἶδος*, and

στέρησις. The term ἀρχή includes also *external* originative sources, e. g. the primary efficient cause (cf. 24ª 27). Cf. Diels, *Elementum*, p. 24: *Metaph.* 1013ª 7–10, 1070ᵇ 22–30.

Aristotle has no quarrel with his predecessors for calling *the primary materials*, out of which the perceptible things come-to-be, 'originative sources' (or 'original reals') in the sense of 'elements'. But they were wrong, he thinks, in supposing that Earth, Air, Fire, and Water (all, or any, of them), or indeed any perceptible body, were such *primary materials*.

29ª 6. ἐξ ὧν: the antecedent is of course τὰ πρῶτα (ª 5).

29ª 8–14. ἀλλ' . . . διορισμόν. Anaximander and Plato are selected for special criticism. The other thinkers are sufficiently refuted by the subsequent exposition of Aristotle's own theory which shows that Earth, Air, Fire, and Water are all equally derivative, since they are all transformations of a prior *substratum*.

Aristotle's objection to Anaximander's ἄπειρον is *not* that it was other than Earth, Air, Fire, and Water—for that is true also of Aristotle's own πρώτη ὕλη: but that, being other than these, it was nevertheless supposed to be a 'body', i. e. possessed of actual existence independent of, and separate from, Earth, Air, Fire, and Water.

29ª 10–13. ἀδύνατον . . . ἀρχήν. Since Anaximander's 'Boundless' is an actual body, it must be characterized by one or the other of the contrasted qualities forming a 'perceptible contrariety' (cf. e. g. * 20ᵇ 16–17). It must e. g. be light or heavy, cold or hot. In other words (cf. Introd. § 10, and * 29ᵇ 7—30ª 29), it must be Earth, Air, Fire, or Water.

In 29ª 11 αἰσθητῆς (HJ) is clearly right. Aristotle could not have written αἰσθητόν (E), τὸ αἰσθητόν (F), or αἰσθητὸν ὄν (L), since that would imply that Anaximander himself spoke of his ἄπειρον as 'perceptible'.

29ª 13–24. ὡς . . . ἐπίπεδα εἶναι. Aristotle has already referred more than once to Plato's attempt in the *Timaeus* to construct the perceptible bodies out of planes, i. e. out of two types of right-angled triangles: cf. * 15ª 29–33, * 15ᵇ 31, * 16ª 2–4, * 25ᵇ 19–25. He now attacks Plato's statements about the ὑποδοχὴ πάσης γενέσεως, and its relation to the elementary triangles and to the four simple bodies, on the ground that 'they are not based on any precisely-articulated conception' (οὐδένα ἔχει διορισμόν, cf. 23ª 22 and 34ᵇ 21).

The perceptible things, Plato had said, are mere 'imitations' or 'images' of the real things—the intelligible Forms. And it is

the very nature of an 'image' to require a something *in which* it 'comes-to-be' and thus obtains *apparent* subsistence (cf. *Timaeus* 52 c). This something, *in which* the 'images' come-to-be, is accordingly postulated as a necessary pre-condition of the γένεσις of the physical Cosmos (ib. e. g. 52 d): and Plato describes its nature in various ways—mostly metaphorical, and partly (it would seem) irreconcilable with one another. Thus he speaks of it as 'the Place'—the empty Space or Extensity 'in which' the perceptible things appear (cf. 52 a, 52 d): as 'the receptacle of all coming-to-be, as it were its Nurse' (49 a, 52 d), or 'its Mother' (51 a): as 'a something which receives all bodies' (50 b περὶ τῆς τὰ πάντα δεχομένης σώματα φύσεως): 'a thing invisible and without shape, omnirecipient' (51 a ἀνόρατον εἰδός τι καὶ ἄμορφον, πανδεχές). Such statements naturally suggest that 'the Omnirecipient' χωρίζεται τῶν στοιχείων, i. e. that it is an entity having a being of its own, separate from, and in independence of, Earth, Air, Fire, and Water and the perceptible bodies generally (29ª 15 τῶν στοιχείων, i. q. τῶν καλουμένων στοιχείων, cf. ª 16). We think of it as a Mirror in which the reflections appear, or a Frame in which the copies of the εἴδη are held. But Plato says other things about τὸ πανδεχές which imply a quite different view of its relation to the perceptible bodies. For he speaks of this omnirecipient formless something as an ἐκμαγεῖον—a modifiable lump or mass—which is changed and transfigured by the incoming images of the real intelligible things, and thus *itself appears* with different shapes and qualities (50 c: for the meaning of ἐκμαγεῖον, cf. *Theaetetus* 191 c with Campbell's note). And he compares it, in its relation to Earth, Air, Fire, and Water, with a lump of gold in its relation to the golden things of various shapes which may be fashioned out of it. Earth, Air, Fire, and Water, he insists, are mere passing transformations of this something, which always retains its receptivity unchanged—just as this and that figured work of the goldsmith are such and such evanescent modifications of gold, which always remains 'gold', however its shape may vary (49 a–50 b).

If we are to press this analogy, the πανδεχές is, it would seem, not only the receptacle *in which* all the perceptible bodies appear, but also the stuff *of which* they are fashioned or *out of which* they are made. And it is now no longer clear whether we are to attribute to it a 'being' separate from the στοιχεῖα which are its transformations.

29ª 15–24. οὐδὲ . . . ἐπίπεδα εἶναι. Plato, Aristotle has just complained (ª 13–15), does not explain whether the Omnirecipient is a *continent* subsisting in independence of the Earth, Air, Fire, and Water which 'appear' in it; or whether it is a *stuff*, logically distinguishable from, but existing only in, and as, those changing figurations which are called the 'elements'. He now complains that Plato makes no use of the Omnirecipient in his theory of the γένεσις of the 'elements'. He compared it to the gold, out of which the goldsmith's works are fashioned: and this comparison implies that the πανδεχές is a stuff underlying, and prior to, the 'elements'. Nevertheless (ª 21 ἀλλά, i. e. in spite of his comparison of the πανδεχές with the gold), when he comes to treat of the γένεσις of the 'elements', he resolves them into triangular planes, without any hint as to how the latter are derived from the ὑποδοχή. Yet it is impossible to identify the ὑποδοχή or the τιθήνη with the planes.

In this passage ª 17–21 (καίτοι . . . ἕκαστον εἶναι) is a parenthesis, in which Aristotle criticizes Plato's use of the analogy of the gold: the rest forms a single argument, in which ª 21–24 (ἀλλὰ . . . ἐπίπεδα εἶναι) justifies the opening assertion that Plato 'makes no use' of the πανδεχές.

The term ὑποκείμενον (29ª 16) is not used by Plato in the passage in question: Aristotle infers that this is in effect his meaning from the analogy of the gold and from the language in the context (*Timaeus*, 49 a–50 b).

The words ὄντων . . . ἀνάλυσιν (ª 22–23) suggest a double reproach: for Aristotle has already urged (a) that it is impossible to construct 'solids', i. e. φυσικὰ σώματα, out of planes, and (b) that it is unreasonable, if you analyse solids into their containing planes, not to complete the mathematical analysis by resolving the planes into lines and the lines into their terminal points (cf. * 15ᵇ 31, with the references to the *de Caelo* there given).

In ª 23 Aristotle adds καὶ τὴν ὕλην τὴν πρώτην, because Plato's τιθήνη or ὑποδοχή fulfils in the *Timaeus* a function analogous to that of πρώτη ὕλη in Aristotle's theory of the γένεσις of the perceptible things.

29ª 16. πρότερον: cf. preceding note. Plato would presumably say that the metaphor of the gold must not be pressed, and that his Omnirecipient is 'prior' to the 'elements' only in the sense in which Aristotle's πρώτη ὕλη is 'prior' to its informations—i. e. *logically* prior. There is no trace of πρότερον in Philoponos.

29ª 17–21. καίτοι . . .. ἕκαστον εἶναι. Plato's analogy is not precise. For you can call a product by the name of that 'out of which' it has developed, only if it has resulted by the 'alteration' of a persistent perceptible *substratum*. If, e. g., the cold thing has become hot, the thing persists and has merely 'altered' from one αἰσθητὸν πάθος to its contrary: hence the product (the hot thing) is still called a 'thing'. Similarly, if the gold persists through the goldsmith's manipulations as a perceptible *substratum*, which 'alters' e. g. from triangular to square or circular, you can call the products 'gold'. But Earth, Air, Fire, and Water come-to-be and pass-away, and are not merely the 'alterations' of a persistent perceptible *substratum*. Hence, if they come-to-be out of the πανδεχές, they cannot be called by its name, as the golden figures can be called, each of them, 'gold'. Yet Plato insists (cf. *Timaeus* 49 d–50 c) that if we are shown a work of the goldsmith, and asked what it is, far the safest answer (μακρῷ πρὸς ἀλήθειαν ἀσφαλέστατον) is to say 'It is gold': and that similarly, if we see what is commonly called 'fire', and are asked what it is, we ought to answer 'It is the Omnirecipient'.

Aristotle calls attention to this distinction of linguistic usage more than once: cf. *Phys.* 245ᵇ 3 ff., *Metaph.* 1033ª 5 ff., 1049ª 18 ff.

When a thing has come-to-be 'out of' x, it is never called x, though in certain cases it may be called by an adjective derived from x (ἐκείνινον, though not ἐκεῖνο). Thus, e. g., a man or a plant is not called that 'out of which' it has come-to-be, nor by an adjective derived from its name: and a house or a statue is not called πλίνθοι or ξύλον, though they are called πλινθίνη and ξύλινος respectively.

If, however, there is ἀλλοίωσις (and not γένεσις), the result *is* called by the name of the *substratum* which has 'altered'. Thus, e. g., if a sick man has recovered his health, we speak of him as 'a man' or 'a healthy man'.

The term ἀλλοίωσις, according to Aristotle's *strict* usage, is limited to the change of παθητικαὶ ποιότητες καὶ πάθη, and does not include change of σχῆμα καὶ μορφή (cf. * 19ᵇ 8–10). Hence the ἔργα fashioned out of gold are not strictly products of 'alteration', and cannot rightly be called 'gold', but only 'golden'. If, then, ἀλλοίωσις (29ª 19) is to be taken strictly, Plato is being criticized (a) for confusing the γένεσις (i. e. the ποίησις) of the golden things with an 'alteration' of gold: and consequently (b)

for supposing that the correct account e. g. of a golden statue is to say 'It is gold': and finally (c) for extending this confusion, and the consequent error of terminology, to the 'elements', which—even on Plato's own theory—are the results of a γένεσις.

But Aristotle may possibly be using ἀλλοίωσις more loosely, to cover any change in the Category of Quality. If so, ἀλλοίωσις would include change of shape (cf. * 19^{b} 12–14), and the works fashioned by the goldsmith would be results of ἀλλοίωσις. Plato would then be criticized for extending a terminological usage, which is correct in the example of the gold and the works fashioned out of it, to an instance of γένεσις, where it is no longer applicable.

29^{a} 24 – ^{b} 3. ἡμεῖς . . . μεταβάλλουσιν. Aristotle now outlines his own view. Earth, Air, Fire, and Water are the *primary* perceptible bodies. But, as *perceptible bodies*, they are γεννητὰ καὶ φθαρτά, and their γένεσις presupposes the same fundamental conditions—the same ἀρχαί—as are presupposed by the γένεσις of any and every perceptible body.

The whole subject has been thoroughly discussed in the *Physics* (A. 6–9), and the ἀρχαί have there been accurately defined and distinguished from one another (29^{a} 27 διώρισται . . . ἀκριβέστερον). The results of the discussion in the *Physics* were used above, 17^{b} 13 ff.: cf. * 17^{b} 14–18, * 17^{b} 29, * 18^{a} 23–25.

The ultimate presuppositions of the γένεσις of any and every perceptible body are (i) πρώτη ὕλη and (ii) a contrariety of qualities for which the ὕλη is the *substratum*. This second presupposition is often expressed by Aristotle in a different manner, so as to bring out the negative 'moment' implied in γένεσις. If a body comes-to-be, the *substratum* passes from a formed-state to a contrarily-formed-state: but the initial formed-state is *at the same time* the στέρησις of the form of the new (emerging) body. And the distinctive feature of a γένεσις is the coming-to-be of a positive something, where previously it was *not*. Hence the second presupposition of γένεσις is an εἶδος with its contrasted στέρησις.

These ἀρχαί of γένεσις (it is all-important to remember) are not in any sense actually existent things. They are not rudimentary stages of a temporal development of the Cosmos, antecedent in time to the emergence of perceptible bodies. No doubt Aristotle's language is at times ambiguous and misleading. But in the main he is clear (at least in the present work) that these

ἀρχαί are the *logical*, not the *temporal*, presuppositions. They are the indispensable ultimate 'moments' which abstracting analysis forces us to recognize as logically presupposed in the γένεσις of any and every perceptible body.

Hence Aristotle is careful to insist that his πρώτη ὕλη is not χωριστή, like e. g. Anaximander's ἄπειρον (cf. * 29ª 8–14). What *exists* is never ὕλη bare, but always formed ὕλη: i. e. always ὕλη along with certain qualities which render it a determinate perceptible body. What *exists* is a *substratum* which, being e. g. actually-hot, is therefore also potentially-cold. In other words, Aristotle's ὕλη is οὐ χωριστή, ἀλλ' ἀεὶ μετ' ἐναντιώσεως (29ª 25–26), or ἀχώριστος μὲν ὑποκειμένη δὲ τοῖς ἐναντίοις (29ª 30–31).

And the same applies, *mutatis mutandis*, to the other ἀρχή of γένεσις. The opposition of εἶδος and στέρησις, which marks the *terminus ad quem* and the *terminus a quo* of the two-sided process (the γένεσις of one thing and the φθορά of another), is clearly the result of a *logical* analysis. And even the ἐναντιώσεις—i. e. the pairs of contrasted perceptible qualities—have no 'existence', except as qualifying the *substratum*.

'The Hot and the Cold', 'The Dry and the Moist', conceived in abstraction from the *substratum* which is hot-dry, hot-moist, cold-dry or cold-moist, are simply one of the two indispensable 'moments' in the constitution of the actual things—the other indispensable 'moment' being the *substratum* conceived in distinction from them. What actually exists is the *qualified substratum*: i. e. (if we take it in its most rudimentary form) one or other of the four 'primary' or 'simple' bodies.

29ª 26. ἐξ ἧς. The antecedent of ἧς is ὕλην (ª 24), not ἐναντιώσεως (ª 26).

29ª 27. αὐτῶν, SC. τῆς ὕλης καὶ τῆς ἐναντιώσεως.

29ª 27–29. οὐ μὴν . . . τούτων. 'Nevertheless we must give a detailed explanation of the primary bodies as well, since they too are similarly derived from the matter.'

The account in the *Physics* was general, applying to the γένεσις of any and every perceptible body. Aristotle now proposes to apply it in particular to the γένεσις of the *primary* perceptible bodies.

29ª 29–32. ἀρχὴν . . . ἀμφοῖν. The parenthetical clause (ª 31–32 οὔτε . . . ἀμφοῖν) justifies the assumption of a third something in addition to the two contraries as their *substratum*. We must reckon πρώτη ὕλη as an originative source and as primary,

because the contraries *alone* cannot serve as an *ἀρχή*, since they presuppose *ὕλη* as their *substratum* if they are to act or suffer action. Cf. *Physics*, e. g. 189ª 21 – ᵇ 3, 191ª 4–5, &c.

29ª 32–35. ὥστε . . . τοιαῦτα. Aristotle's language here is misleading, because it suggests *three successive stages* in the development of the perceptible bodies. But in fact (cf. * 29ª 24–ᵇ 3) neither *πρώτη ὕλη* nor the *ἐναντιώσεις* 'exist'. They do not precede the 'primary' bodies in time, but are abstract 'moments' logically presupposed in their being.

29ª 35 – ᵇ 1. ταῦτα . . . ἄλληλα. This clause justifies ª 34–35 (*τρίτον δ' ἤδη*). Earth, Air, Fire, and Water, since they change into one another, are composite of matter and form: i. e. they presuppose *ὕλη* and *ἐναντίωσις*, and are therefore reckoned as an *ἀρχή* of the perceptible bodies only in the *third* place.

29ᵇ 1–2. οὐχ ὡς . . . ἀλλοίωσις: cf. 14ᵇ 15–26.

29ᵇ 2–3. αἱ δ' . . . μεταβάλλουσιν. The contrarieties, as contrasted with 'the primary bodies', do not change (cf. e. g. 22ᵇ 16–18), and are therefore rightly reckoned as *ἀρχαί* and placed before 'the primary bodies' in Aristotle's list.

29ᵇ 3–4. ἀλλ' . . . ἀρχάς; 'Nevertheless even so the question remains: What sorts of contrarieties, and how many of them, are to be accounted "originative sources" of body?' The use of *ὡς* for *οὕτως* is rare in Aristotle: but cf. *de Caelo* 302ᵇ 24. I can make nothing of Bekker's reading (*καὶ ὡς σώματος*). It seems best to read the sentence as a question, to supply *ἐναντιώσεις* as the noun to which *ποίας καὶ πόσας* refer, and to take *ἀρχάς* as predicate.

B. 2

29ᵇ 7—30ª 29. Ἐπεὶ . . . ταύτας. In this chapter Aristotle establishes that the *ἐναντιώσεις*, which the 'simple bodies' presuppose as one of their 'constitutive moments', are *θερμόν–ψυχρόν* and *ξηρόν–ὑγρόν*. As we shall see in Chapter 3, each of the simple bodies (Earth, Air, Fire, and Water) is distinctively characterized by *θερμόν* or *ψυχρόν* coupled with *ξηρόν* or *ὑγρόν*.

The reader will remember that neither *πρώτη ὕλη* nor the *ἐναντιώσεις* are anything but 'moments' abstracted by logical analysis (cf. * 29ª 24 – ᵇ 3). The *ἐναντιώσεις* therefore are couples of contrasted *qualities*, not of contrasted *qualia*: i. e. properly-speaking they are *θερμότης–ψυχρότης*, *ὑγρότης–ξηρότης* (cf. e. g. 29ª 34, ᵇ 11–12), and not *θερμόν–ψυχρόν*, *ὑγρόν–ξηρόν* (cf

e. g. 29ᵇ 18–20). The neuter adjectives, especially when the article is prefixed, *suggest* the concretely qualified matter, which alone has actual existence: they *suggest* 'the hot-stuff', 'the cold-stuff', &c., i. e. the *qualia* instead of the abstract *qualities*. But though Aristotle is no doubt thinking of actual constituents, he defines them *in respect to their qualities*. He is speaking of *qualia*—of qualified stuffs; but he is attending to the *qualities* and trying to determine these in abstraction from the stuff which they qualify. On the whole, therefore, I have thought it best to speak throughout of 'elementary *qualities*', and to render e. g. τὸ *θερμόν* by 'the hot' rather than by 'the hot stuff'.

From another point of view, the term 'quality' is somewhat misleading. For it is clear from Aristotle's definitions that *the hot*, *the cold*, *the dry*, and *the moist* are in fact certain characteristic powers of acting and susceptibilities to action. Aristotle himself constantly refers to them as δυνάμεις (cf. e. g. *Meteor.* 378ᵇ 29 and 34, 379ᵇ 11, &c.). We might therefore be tempted to call them 'elementary forces', instead of 'elementary qualities' (cf. Dr. William Ogle's note in his translation of the *de Part. Anim.* 646ª 16). But 'force' would not naturally include 'susceptibilities to action' (the δυνάμεις παθητικαί). After much hesitation I have decided to use the term 'quality', which has at least one merit—viz. that it emphasizes the important fact that these ἐναντία *qualify* πρώτη ὕλη and thus constitute the distinctive characteristics of the primary bodies.

The meaning of *θερμόν*, *ψυχρόν*, *ὑγρόν*, *ξηρόν*—and of the other tangible qualities discussed in the present chapter—must of course be gathered from Aristotle's definitions. It is not possible to find any English terms which are precisely equivalent. I use the terms 'hot', 'cold', 'moist', 'dry', as mere conventional symbols. 'Moist-dry', as we shall see, is a most inadequate rendering of *ὑγρόν–ξηρόν*: and so also is 'fluid–solid', which Dr. Ogle (l. c.) prefers. And 'hot–cold' is defective as a rendering of *θερμόν–ψυχρόν*, in that it conveys no hint of the feature on which Aristotle lays stress. Cf. * 29ᵇ 26–30, * 29ᵇ 30–32.

29ᵇ 7–13. Ἐπεὶ . . . στοιχεῖον. We are to determine what 'qualitative differences' constitute the distinctive forms of perceptible body *as such*, i. e. differentiate perceptible body *in general* into its primary irreducible species. We must therefore look amongst the qualities which characterize *all* perceptible bodies. These are the 'tangible' qualities—those discriminated by the sense of

touch. For all perceptible bodies possess at least some of the 'tangible' qualities, whilst not all exhibit the further qualities which are the objects of vision, hearing, taste, and smell. Cf. *de Anima*, e. g. 423^{b} 27–29 which refers to the present chapter.

29^{b} 9. εἴδη . . . ποιοῦσιν: 'constitute "forms" and "originative sources" of body'.

The qualities which belong to certain *ἐναντιώσεις* constitute the 'forms' of perceptible bodies, *qua* informing *πρώτη ὕλη*. Aristotle adds *καὶ ἀρχάς*, because we are looking for contrary qualities which are the forms of the *primary* perceptible bodies, and which are therefore 'originative sources' of perceptible body in general: cf. 29^{a} 33–34, 29^{b} 3–4.

29^{b} 10–11. κατ' . . . ἐναντίωσιν: 'for the primary bodies are differentiated by a contrariety, and a contrariety of tangible qualities'.

The subject of *διαφέρουσι* has to be supplied from the context. It is—as Philoponos rightly explains—*τὰ σώματα τὰ πρῶτα, ὧν τὰς ἀρχὰς ζητοῦμεν*.

The primary bodies, as Zabarella reminds us, must be characterized by *contrary* qualities, since they must be capable of combining: and combinables must be reciprocally *ποιητικά* and *παθητικά*, and therefore also *ἐναντία* (cf. e. g. * 22^{b} 1–26, * 23^{b} 1—24^{b} 24, * 28^{a} 18–31). And they must be differentiated by *tangible* qualities, because as perceptible bodies they must possess *tangible* qualities, even if—as *the simplest* of bodies—they possess no others (cf. * 29^{b} 7–13).

29^{b} 13. ποιεῖ στοιχεῖον. Aristotle sometimes calls the elementary qualities *στοιχεῖα* (cf. e. g. 30^{a} 30): but *στοιχεῖον* here means 'primary body', i. e. one of the 'so-called elements' (cf. * 22^{b} 1–2).

None of the contrary qualities, except those belonging to the primary contrarieties of touch, 'makes' a 'primary body', i. e. constitutes it as its form (for this sense of *ποιεῖ*, cf. 29^{b} 9 *ποιοῦσιν*).

29^{b} 14–16. καίτοι . . . πρότερον. Aristotle here anticipates and answers a possible objection. Vision is 'purer' than touch (cf. *Eth. Nic.* 1176^{a} 1): it is the 'clearest' of all the senses (*Probl.* 886^{b} 35): and if touch is the most *indispensable* sense, in that life is impossible without it, vision contributes to the comforts and refinements of life, and in particular helps us towards the attainment of knowledge (cf. e. g. *de Anima* 435^{b} 19–25, *de*

Sensu 436^{b} 12—437^{a} 18, *Metaph.* 980^{a} 24–27). Vision therefore, it may be said, is *prior* to touch, in the sense in which the more perfect, and the more valuable and desirable, is *prior* to the less (cf. e. g. *Metaph.* 1050^{a} 3 ff., 1077^{a} 19–20, *Categ.* 14^{b} 4–8). But if so, the contrarieties which are the subject-matter or 'objects' of vision are, similarly, *prior* to those which are the 'objects' of touch (cf., for this sense of *ὑποκείμενον*, e. g. *de Anima* 425^{b} 14, 426^{b} 8–11, *Rhet.* 1355^{b} 28–32: Bonitz, *Ind.* 798^{b} 60—799^{a} 27).

Aristotle does not discuss the question of fact. He is ready to admit that the qualities which make a body visible may very likely be 'naturally prior' to those which render it tangible. But this fact, if it be a fact, is (he urges) irrelevant. For we are looking for qualities which constitute the forms of perceptible, i. e. tangible, bodies as such—qualities, therefore, which belong to tangible bodies *per se*. Now the qualities, which are the objects of vision, do not belong to tangible bodies *per se*, but *καθ' ἕτερον*.

Aristotle discusses in the *de Anima* (418^{a} 26 ff.) what *τὸ ὁρατόν* (the *ὑποκείμενον* of vision) is. As the discussion proceeds, it appears that the 'object of vision' includes (a) *colours*, which are seen in light, and (b) *a nameless quality*, which is present in certain things and causes them to be seen in the dark, though they are not thus seen in the light. It is clear from Aristotle's instances (*μύκης, κέρας, κεφαλαὶ ἰχθύων καὶ λεπίδες καὶ ὀφθαλμοί, de Anima* 419^{a} 5) that he is thinking partly of what we should call 'phosphorescent' objects. I do not know any passage where he explains exactly what this 'nameless quality' is, which causes these various things to gleam in the dark: but *colour* (that subdivision of *τὸ ὁρατόν* which is seen in light) is discussed in the *de Sensu* (439^{a} 18 ff.) and defined (439^{b} 11–12) as *τὸ τοῦ διαφανοῦς ἐν σώματι ὡρισμένῳ πέρας*. Colour, then, it is clear, belongs to the tangible body, in so far as that contains *τὸ διαφανές* in itself: and *τὸ διαφανές* (cf. *de Anima* 418^{b} 4 ff.) is neither *ἁπτόν* nor inherent in the body *qua ἁπτόν*.

29^{b} 16–18. αὐτῶν . . . ἐναντιώσεις. The qualities which differentiate the primary bodies are, as we have seen, those which belong to the contrarieties of touch. But some of the latter are derivative: our next task therefore is 'to distinguish which amongst the tangible differences and contrarieties are primary'.

I have followed HJ and Γ in omitting *πρῶτον* in ^{b}17: the passage is certainly better without it.

29^{b} 18–20. εἰσὶ . . . λεπτόν. All the qualities defined in this chapter (the reader will observe) are defined by reference to perception. Thus, e. g., hard and soft are the incompressible and compressible estimated by our sense of touch, not the absolutely impenetrable and its contrary. Cf. e. g. *Meteor.* 382^{a} 17–21.

The omission of *πυκνόν–μανόν* from this list of the contrarieties of touch is to be explained by the fact that Aristotle denied the existence of dense and rare in the popular sense : i. e. he denied the existence of atoms and interspaces, and rejected all cognate conceptions of the constitution of matter (cf. * 21^{a} 5–9). Hence, though he still employs the terms *πυκνόν–μανόν*, he treats the contrariety as a form of *παχύ–λεπτόν* (cf. *de Caelo* 303^{b} 22–25), or again as a form of *βαρύ–κοῦφον* (cf. *Phys.* 217^{b} 11–12).

29^{b} 20–24. τούτων . . . ἄλληλα. The primary bodies combine (*μίγνυται*) to form the ὁμοιομερῆ, and—as we shall see in Chapter 4—they are transformed into one another (*μεταβάλλει εἰς ἄλληλα*). Hence (cf. * 29^{b} 10–11) they must be reciprocally *ποιητικὰ καὶ παθητικά* : and the qualities which constitute them must express powers of acting and susceptibilities to action.

Now, although Earth, Air, Fire, and Water are all 'light' or 'heavy' (cf. Introd. § 10), and although all bodies which possess 'weight' or 'lightness' are *in fact* *ποιητικὰ καὶ παθητικά*, it is not *qua* light or *qua* heavy that they act upon, and are acted upon by, one another (cf. * 23^{a} 9–10). Hence the contrariety 'light–heavy' is not constitutive of the primary bodies.

According to Philoponos (p. 214, ll. 31 ff.), 'rough–smooth', which is not expressly eliminated in what follows, is to be rejected for the same reason.

29^{b} 22. ποιεῖν τι ἕτερον. For the construction, cf. e. g. *Meteor.* 385^{a} 2–4 *λευκὸν γὰρ καὶ . . . θερμὸν καὶ ψυχρὸν τῷ ποιεῖν τι δύνασθαι τὴν αἴσθησίν ἐστι.*

29^{b} 24–26. θερμὸν . . . λέγεται. (i) Hot–cold and dry–moist are reciprocally active and passive in the sense that the *substratum*, which is hot, is *eo ipso* both alterative of, and liable to be altered by, that which is cold ; whilst the *substratum*, which is moist, is *eo ipso* both alterative of the dry, and subject to its action. Each of these four qualities, within its own contrariety, is both active and passive in relation to its contrary. The hot and the cold, *qua* contraries informing the same matter, act and react on

one another, and are each in turn both agent and patient. Each tends to assimilate its contrary to itself, and to be assimilated by it: and the result of this reciprocal action-passion is the *tempering* of both qualities and their fusion in an intermediate quality, which is *less-cold-and-more-hot* than the original cold and *less-hot-and-more-cold* than the original hot (cf. e. g. * 27^{b} 22–31, * 28^{a} 29–31, * 34^{b} 8–16).

By a similar reciprocal action-passion, the moist and the dry tend towards an intermediate or tempered state, in which *the dry* is more pliable and more cohesive by admixture of *the moist*. But this tempering of the dry by the moist requires *for its completion* the 'active operation' of the hot-cold (or of the tempered-hot) in a sense which we have now to consider.

(ii) For although the reciprocal action-passion of the qualities within each contrariety is an essential condition of the emergence of a new ὁμοιομερές, another kind of action-passion, *in which the hot-cold is agent and the dry-moist is patient*, is also involved: and it is to this second kind of action-passion, where one contrariety is active and the other contrariety passive, that Aristotle is referring in the present passage (cf. *Journal of Philology*, No. 57, pp. 83–86). The whole subject is worked out in *Meteor.* Δ with great elaboration: I must content myself here with a brief outline, which will be sufficient for the understanding of the present sentence.

Aristotle maintains that everywhere, if we look at the physical phenomena, we shall see heat and cold functioning as active and controlling forces. They reduce the materials—whether these be the same in kind, or of different kinds—to definite shape, they cause them to grow together into a unity, and they introduce change into them. Moistening and drying, hardening and softening, are the work of heat and cold. On the other hand, the materials, which submit to these operations, are everywhere the dry or the moist or the things compounded of dry and moist (*Meteor.* 378^{b} 10–20). Hence all birth and all death—the coming-to-be and passing-away of every ὁμοιομερές in a plant or animal, and thus indirectly of every plant or animal itself—are to be ascribed to the operation of the hot-cold on the dry-moist. Birth—the coming-to-be of any ὁμοιομερές in animate things—is, from this point of view, a change produced in the passive δυνάμεις (i. e. a development of the dry-moist, which is the material) by the agency of the hot-cold, i. e. the tempered-hot (cf. e. g.

Zabarella, *de Misti Gen. et Inter.* i, ch. 5). When the hot and cold are present in due proportion, they control the matter (the dry–moist) and bring the ὁμοιομερές into being (*Meteor.* 378^{b} 28—379^{a} 1).

Death and the processes which lead to it—withering in plants, senile decay in animals—are to be ascribed to the failure of this control. For just as the hot–cold gave definite shape and consistency to the dry by tempering it with the moist, and thus brought the ὁμοιομερές into being, so, as the inner heat grows less, dissolution sets in. The inner cold predominates over the inner heat: and the heat of the environment (i.e. in the environing 'element' of the living thing) overcomes the now enfeebled inner heat (cf. * 23^{b} 7-10). It is drawn out, and with it the inner moisture also evaporates. Moreover, when the inner heat is gone or enfeebled, the living thing has lost the power of drawing in fresh moisture from the environment, and of digesting its food (cf., on the inner heat, * 20^{a} 8, * 20^{b} 34—21^{a} 29, * 22^{a} 10–13, * 36^{b} 8–10). Hence the animate thing (e.g. the ὁμοιομερές) passes to its natural end. It putrefies, becoming first *moist*, and finally—as the moisture evaporates with the vanishing inner heat—*dry*. This putrefaction (σῆψις) is the natural end of all animate ὁμοιομερῆ and of the organisms to which they belong. They all collapse in the end into γῆ καὶ κόπρος (*Meteor.* 379^{a} 3–26).

Thus in the coming-to-be and passing-away of an animate ὁμοιομερές, two of the four elementary qualities (viz. the dry and the moist) are *par excellence* 'matter': for their rôle is purely 'passive'. The other two (viz. the hot and the cold) are 'active', either to form and mould, or to dissolve and destroy. The function of *the cold* is apparently subsidiary to that of *the hot*. It is 'active' either *qua* tempering the hot, or—in the process of dissolution—*qua* assisting the heat of the environment to overcome the inner heat, and thus to wrest the dry–moist from its control (cf. Zabarella, l. c.: *Meteor.* 382^{b} 6–10). In order to prevent a possible misunderstanding, the reader may be reminded that the *material constituents* of every ὁμοιομερές are the four 'primary bodies' (cf. 34^{b} 31—35^{a} 9), which are distinctively characterized each by a different couple of the four elementary qualities (cf. * 29^{a} 24 – ^{b} 3, * 30^{a} 30—31^{a} 6). It is these four primary bodies which *qua* hot and cold are *par excellence* 'active' and *qua* moist and dry are 'passive', and therefore *par excellence* 'matter', in the

generation and dissolution of the ὁμοιομερῆ. Although, therefore, Aristotle attributes efficient operations to the hot–cold in the *Meteorologica*, their action is not external like that of an 'efficient cause' proper. It is an 'immanent' action—an action exerted by the material constituents of the ὁμοιομερῆ.

Not only birth and death, not only the coming-to-be and the passing-away of the animate ὁμοιομερῆ, but all kinds of natural processes *within the already subsistent compound natural things* are ascribed by Aristotle to the active operations of the hot–cold on the dry–moist. Thus (cf. *Meteor.* 379b 10—381b 22) he attributes to *heat* πέψις and all its sub-forms, viz. πέπανσις (ripening) and the nameless natural processes corresponding to, and imitated by, ἕψησις (boiling) and ὄπτησις (baking). Similarly he attributes to *cold* ἀπεψία and its sub-forms (ὠμότης, μώλυσις, στάτευσις), i. e. failures in natural development corresponding, each to each, to the successes effected by heat in 'digesting', 'ripening', and in the natural operations analogous to 'boiling' and 'baking'.

29b 26–30. θερμὸν . . . μὴ ὁμόφυλα. The characteristic function of the hot and the cold, by which Aristotle here defines them, is that of *bringing together and uniting*. (i) The *hot* 'associates' things of the same kind, and if it also 'dissociates', that is a secondary function: for in bringing together the homogeneous, it incidentally eliminates the heterogeneous (cf. also *de Caelo* 307a 31 – b 5). If e. g. wine be heated in a closed vessel, the heat will collect all the earthy particles at the bottom and all the vaporous particles at the top. (ii) The *cold* 'associates' homogeneous and heterogeneous things alike. If e. g. water freezes right through, the cold will bring, and hold, together everything which was contained in it—bits of wood, straws, animalculae, &c. (cf. Zabarella and Philoponos, *ad loc.*).

One of the functions ascribed to heat and cold in the *Meteor.* is the causing homogeneous and heterogeneous things 'to grow together' (378b 15 συμφύουσαι: see preceding note). In other passages (384b 24–26, 388a 23–25, 390b 4) the work of the hot and the cold in the constitution of the ὁμοιομερῆ is summarized as a 'thickening and solidifying' (παχύνοντα καὶ πηγνύντα ποιεῖται τὴν ἐργασίαν αὐτῶν). But, consistently with Aristotle's general view of the effect of contraries, τῆξις as well as πῆξις is ascribed to these forces. For the hot dissolves what has been solidified by cold (we may think e. g. of fire melting ice and

wax), and the cold dissolves what has been solidified by heat (e. g. water, *qua* cold, dissolves soda and salt): cf. *Meteor.* 382^{b} 30—383^{b} 17, and below, * 30^{a} 4–7.

29^{b} 27. φασί. Cf. 36^{a} 3–4. The people in question were probably Pythagoreans: cf. * 36^{a} 1–12.

29^{b} 30–32. ὑγρὸν . . . δυσόριστον δέ. The 'passive' qualities are defined as (a) that which is readily adaptable to the shape of its continent, since it is not determinable by any characteristic outline of its own—*τὸ ὑγρόν* (cf. 28^{a} 35 – ^{b} 4): and (b) that which is readily determinable by its own characteristic outline, and is therefore not easily adaptable in shape—*τὸ ξηρόν*.

The same definitions are assumed below (cf. * 34^{b} 34—35^{a} 3) and in the *Meteor.* (cf. e. g. 360^{a} 23, 378^{b} 23–25). The *ὑγρόν* and the *ξηρόν* are in fact complementary to one another, each serving the other as a kind of glue: for though the *ξηρόν* is *εὐόριστον οἰκείῳ ὅρῳ*, the cause of its getting and keeping its own shape is the *ὑγρόν* which is admixed with it (*Meteor.* 381^{b} 29 ff.).

It is clear that 'moist' and 'dry' are quite inadequate renderings of *ὑγρόν* and *ξηρόν*. I have retained them, partly because of the tradition, but mainly because there are no alternatives more satisfactory. Dr. Ogle prefers 'fluid' and 'solid' (cf. * 29^{b} 7—30^{a} 29). But though 'fluid' applies, like *ὑγρόν*, to Air as well as to Water, 'solid' is clearly inapplicable to Fire, which (according to Aristotle's doctrine) is *θερμὸν καὶ ξηρόν*. Moreover, 'solid' is a useful term to translate *τὸ πεπηγός*, which (as we shall see) is a subordinate form of *τὸ ξηρόν* proper.

29^{b} 32–34. τὸ . . . τούτων. For the omission of *τραχύ–λεῖον*, see * 29^{b} 20–24. The words *καὶ αἱ ἄλλαι διαφοραί* probably refer not to *τραχύ–λεῖον*, but to the varieties of *ξηρόν–ὑγρόν*: cf. * 30^{a} 12–24.

Since Aristotle claims (30^{a} 24–25) to have reduced all the other tangible differences to the first *four*, *τούτων* (29^{b} 34) perhaps includes hot and cold as well as dry and moist. It is true that in what follows nothing is said of hot and cold: Aristotle derives *fine* and *coarse*, *viscous* and *brittle*, and *hard* and *soft* from the *moist* and *dry*. But Zabarella seems to be right in suggesting that they are in fact modifications of the moist and the dry, produced in them by the action of the hot and the cold: cf. the following notes.

29^{b} 34—30^{a} 4. ἐπεὶ . . . ξηροῦ. *τὸ λεπτόν* is *pervasive* (cf. *Meteor.* 365^{b} 33–35) and *expansive* (cf. e. g. *de Caelo* 303^{b} 22–29,

304^{a} 30–31 : as we saw, * 29^{b} 18–20, Aristotle connects *μανόν–πυκνόν* with *λεπτόν–παχύ*). Hence it tends to 'fill up' any vessel which may contain it, i. e. it is *ἀναπληστικόν*, and this shows that it is closely connected with *τὸ ὑγρόν*. Since the hot is said to be the cause of rarefaction, and the cold of condensation (*de Gen. Anim.* 783^{a} 37 – ^{b} 2 ; and cf. below, 30^{b} 11–13), we may perhaps infer that *λεπτόν–παχύ* are derivative forms of *ὑγρόν–ξηρόν* produced by the agency of the hot and the cold respectively.

30^{a} 1–3. λεπτομερὲς . . . τοιοῦτον. If the text is sound, the argument seems to be that just as *τὸ ὑγρόν* is *ἀναπληστικόν* because it follows the outline of the vessel containing it, so *τὸ λεπτόν* is *ἀναπληστικόν*, because, owing to the fineness (i. e. the smallness) of its parts, it leaves no cranny of the containing receptacle unfilled.

Aristotle identifies *τὸ λεπτόν* with *τὸ λεπτομερές* (cf. Bonitz, *Ind.* 427^{b} 6–10), and the latter with *τὸ μικρομερές*.

In ^{a} 3 *τοιοῦτον*, i. q. *τοιοῦτον ὥστε ὅλον ὅλου ἅπτεσθαι* : 'such as to be in contact with its continent, whole with whole'. This is only another way of saying that it is *τοιοῦτον ὥστε ἀκολουθεῖν τῷ ἁπτομένῳ* (cf. 29^{b} 35–^{a} 1), i. e. 'such as to follow the outline of the continent which is in contact with it'.

30^{a} 4–7. πάλιν . . . ὑγρότητος. On *τὸ γλίσχρον*, cf. * 28^{b} 4. The following further information may be gathered from the *Meteor.* (i) Viscous liquids, though they may contain solid matter, refuse to precipitate it, owing to their viscosity (382^{b} 13–16). (ii) Some viscous substances—e. g. bird-lime (*ἰξός*)—refuse to solidify (are *ἀπηκτά*) owing to their viscosity. Oil's refusal to solidify, whether by heat or cold, is however attributed to the air, of which it is full, rather than to its viscosity (383^{b} 20 ff., 385^{b} 1–5 : it appears from *de Part. Anim.* 648^{b} 30–33, that oil *does* 'become cool and solidify'—i. e. freeze—though more slowly than blood and than boiling water). (iii) Since *τὸ γλίσχρον* is 'extensible' or cohesive (cf. * 28^{b} 4), it is sometimes contrasted with *τὸ ψαθυρόν*, the 'non-cohesive' or 'friable' (cf. e. g. *Meteor.* 385^{a} 17, 387^{a} 11–15). Thus, e. g., water is *ψαθυρόν* in contrast to oil. It falls apart into isolated drops : and therefore is more difficult to hold in one's hand than oil. Oil can be 'drawn out' owing to its *γλισχρότης* (*de Sensu* 441^{a} 23–26).

Aristotle says here (30^{a} 4–6) that *τὸ γλίσχρον* is a modification of *τὸ ὑγρόν*, but does not explain what the modification is, nor how it is produced. According to Zabarella, it is a *ὑγρόν* 'which

has been very efficaciously combined with a little *ξηρόν*'. Can we perhaps infer from Aristotle's instance (oil) that it is a *ὑγρόν* which has become 'full of air'—for that is the peculiarity of oil? We are not told what fills the *ὑγρόν* with air—whether e. g. this is an effect of the hot or the cold.

Since Aristotle says that *τὸ κραῦρον* is 'that which is so completely dry, that failure of moisture has actually caused it to solidify' (30ª 6–7, cf. ª 22–23), we may hope to gain some light on the subject from *Meteor.* 382ᵇ 31 ff. and 385ª 22–33. For we are there told to distinguish, amongst the bodies 'which solidify and harden', (a) those which are forms of Water and (b) those which are forms of Earth. (a) *The forms of Water* are solidified by the cold, which crushes out the hot (*ἐκθλίβοντος τὸ θερμόν*)—the moist evaporating along with the vanishing hot. They solidify, therefore, *owing to the absence of the hot*: and they liquefy again by heat (cf. * 29ᵇ 26–30). Ice, lead, and bronze are given as instances. (b) *The forms of Earth* are solidified by the hot, which dries up the moist in them. They solidify, therefore, *owing to the absence of the moist.* The instances given are *κέραμος* (terra-cotta?), soda (*νίτρον*), salt, *γῆ ἡ ἐκ πηλοῦ*. Most of these liquefy again by the moist: *κέραμος* is an exception, and its refusal to liquefy is explained by Aristotle on other grounds. From the present passage we should naturally infer that *τὸ κραῦρον* is a form of Earth, which has solidified owing to the complete elimination of its moisture by the hot. If so, ice is not strictly speaking *κραῦρον*. For though it shares one characteristic property with *τὸ κραῦρον*, viz. that it is *θρανστόν* (cf. *Meteor.* 386ª 10 and *de Part. Anim.* 655ª 31–32), it is a form of Water, and its solidification is due *primarily* to the absence of the hot, not to the absence of the moist. Aristotle, however, says of the egg-shell that, when completely developed, it becomes *σκληρὸν καὶ κραῦρον*, and he ascribes its solidification to *the cold.* It 'comes out' soft, but is immediately cooled and thus solidified —the little moisture in it quickly evaporating, and only the earthy element of its consistency remaining (*de Gen. Anim.* 752ª 30 ff.).

30ª 8–12. *ἔτι . . . ξηρόν.* The matter of every composite body is an attemperament of dry and moist (cf. * 29ᵇ 30–32); and according to the proportion of dry and moist in this attemperament—which depends upon *πῆξις*—the body is either *μαλακόν* or *σκληρόν*. Since *πῆξις* is effected by *the hot* or *the cold* or by both together, *μαλακόν* and *σκληρόν* are modifications in the moist and

the dry produced by the agency of the hot and the cold (cf. * 29ᵇ 26–30, *Meteor.* 382ª 8–11, ª 22 ff.).

The hard or rigid (*σκληρόν*) does not yield to pressure by withdrawing into itself, whereas the surface of a soft or plastic (*μαλακόν*) body retires under pressure upon the body itself (cf. *de Caelo* 299ᵇ 13–14). Water on the other hand—or any *ὑγρόν*—yields to pressure by total displacement (cf. *Meteor.* 382ª 11–14, 386ª 24–25. Water *ἀντιπεριίσταται* or *ἀντιμεθίσταται*).

30ª 9. μεθιστάμενον, i. q. *ἀντιμεθιστάμενον*: see preceding note.

30ª 11–12. τὸ δὲ . . . ξηρόν. This is not very clear: for (a) the *μαλακόν* as well as the *σκληρόν* involves *πῆξις*, and (b) the *κραῦρον* as well as the *σκληρόν* is *πεπηγός* (30ª 6–7).

Perhaps Aristotle means, as Zabarella suggests, that a body becomes 'hard', if the *πῆξις* has been carried so far as to eliminate the moist. The result is then *τελέως ξηρόν*, and it is (i) *κραῦρον*, *qua* deprived of its moisture and therefore easily *θραυστόν*, and (ii) *σκληρόν*, *qua* not yielding to pressure.

30ª 12–24. λέγεται . . . ὑγροῦ. Aristotle here distinguishes three subordinate senses of *ὑγρόν* and *ξηρόν*, and shows that they all derive from the moist and dry which were first mentioned, i. e. from *ὑγρόν* and *ξηρόν* in the sense defined above (29ᵇ 30–32).

The term *ὑγρόν* is applied (i) to that which has foreign moisture on its surface—the 'moistened' or 'damp' (*διερόν*), and (ii) to that which has foreign moisture penetrating to its core—the 'sodden', 'drenched', or 'sopping' (*βεβρεγμένον*: the term is used e. g. of wool and of earth, *Meteor.* 385ᵇ 14, &c., and of a sponge, ib. 386ᵇ 5).

Correspondingly, the term *ξηρόν* is applied (i) to the contrary of the *διερόν*, i. e. to that which (though it was, or might have been, damp) is 'dried' (ª 18–19); and (ii)—though Aristotle does not expressly mention this use of the term—to the contrary of the *βεβρεγμένον*, i. e. to that which (though it was, or might have been, sodden) is 'dried through and through'.

Finally (iii) *τὸ ὑγρόν* may mean that which contains moisture of its own; and may thus be contrasted with that form of the *ξηρόν* which is called *πεπηγός* or 'solidified' (30ª 20–24).

The antithesis *ὑγρόν–πεπηγός* was used above, 27ª 17–22. Philoponos rightly explains that *ὑγρόν* in this sense applies to '*τὰ τηκτά*, e. g. wax, lead, and the like'. These 'liquefiable' substances differ from *ὑγρά* proper: for whereas the latter are nothing but *ὑγρά* (are *ὑγρά* through and through), the former *ἐν τῷ βάθει*

κεκρυμμένην ἔχει τὴν οἰκείαν ὑγρότητα. They also differ from τὰ βεβρεγμένα (e. g. mud, or the sopping sponge), because the ὑγρότης in them is *their own*, and not imported from without: it is οἰκεία not ἀλλοτρία, or συμφυής not ἐπακτός (cf. *Meteor.* 382b 11).

It is clear that these three subordinate senses of ὑγρόν and ξηρόν derive from the primary ὑγρόν and ξηρόν, because the latter are employed in defining them. Thus, e. g., *the damp* is that which has on its surface a foreign ὑγρότης, i. e. a ὑγρόν in the primary sense. *The solidified* is that which has been deprived of a ὑγρότης (i. e. a ὑγρόν in the primary sense) originally belonging to it, and is thus ξηρόν in the primary sense, viz. δυσόριστον—not easily adaptable in shape.

30a 13–15. ἀντίκειται . . . λεχθέντων. βεβρεγμένον and its unnamed contrary are not here referred to, and we have therefore two (not three) subordinate senses of ὑγρόν–ξηρόν: viz. (i) damp–dried and (ii) liquefiable–solidified.

ἅπαντα δὲ ταῦτ' (a 14), i. e. διερόν and *its contrary* ξηρόν, πεπηγός and *its contrary* ὑγρόν.

τῶν πρώτων λεχθέντων (a 15), 'those which were first mentioned': cf. ἡ πρώτη λεχθεῖσα ἀπορία (*Polit.* 1282b 1), ἡ πρώτη λεχθεῖσα ἀπεψία (*Meteor.* 381a 13).

Bonitz, however (*Ind.* 653a 50–51), interprets 'in their primary sense', and suggests πρώτως as an emendation of πρώτων: cf. 30a 19.

30a 21–23. ὑγρὸν . . . ταύτης. Aristotle here contrasts *the sodden* with *the liquefiable*: previously (a 16–18) *the sodden* was distinguished from *the damp*.

B. 3

30a 30—31a 6. Ἐπεὶ . . . ξηροῦ. The doctrine of this chapter may be summarized thus:—It is *mathematically possible* to combine any four terms in six different couples. But, of the four elementary qualities, hot cannot be coupled with cold, nor dry with moist, since they are contraries. Hence the possible couples of these four qualities are *really* only four (30a 30 – b 1).

Conformably to this result, each of the 'so-called elements', which appear to be *simple* bodies, is in fact characterized by (a different) one of the four possible couples of qualities: and there are four of these 'elements', corresponding in number to the four elementary qualities. This correspondence (of the 'simple bodies' to the qualities) is to some extent confirmed by reflection upon the views of previous thinkers (30b 1–21).

Earth, Air, Fire, and Water, however, are not *really* simple bodies. The *real* 'simple bodies' are like them, but more pure (**30ᵇ 21–30**).

The simple bodies fall into two pairs, according as they tend to move 'up' to the periphery or 'down' to the centre of the Cosmos. From this point of view, Fire and Air are contrasted with Earth and Water. From another point of view, Fire and Earth *as extremes* are contrasted with Air and Water *as intermediates*. But though they thus fall into pairs, they are *four*: and, *qua* four, each of them is primarily and distinctively characterized by (a different) one of the four qualities (**30ᵇ 30 – 31ª 6**).

30ª 30. στοιχεῖα: cf. * 28ᵇ 26—35ª 23, * 29ª 5, * 29ᵇ 2–3, * 29ᵇ 13. The word here and at ª 33 means the elementary qualities, which are genuine (not merely 'so-called') *στοιχεῖα*.

30ᵇ 1–7. ἠκολούθηκε . . . λόγον. Aristotle has proved that there must be precisely four elementary qualities (hot, cold, dry, moist), capable of forming precisely four couples. It is in consonance with these results of theory (*κατὰ λόγον*, ᵇ 2, 7: *εὐλόγως*, ᵇ 6) that common opinion, resting on the evidence of perception, recognizes *four* 'simple' bodies, and attributes to them respectively, as their characteristic qualities, precisely these four couples.

ἀκολουθεῖν, i. q. *ὑπάρχειν*, *κατηγορεῖσθαι* (cf. Bonitz, *Ind.* 26ᵇ 1 ff.), but the term is used here with *κατὰ λόγον* to suggest that the attribution of these couples to Earth, Air, Fire, and Water is a logical consequence of the theory which Aristotle has developed.

There is a double antithesis implied in *φαινομένοις* (30ᵇ 2), viz. (a) that between *appearance* and *reality*, and (b) that between what seems on the evidence of *the senses*, and what is on the evidence of *reasoning*. Earth, Air, Fire, and Water appear to perception to be 'simple' bodies: but they are not really so, as reflection will show (cf. 30ᵇ 21–30).

30ᵇ 4. οἷον . . . ἀήρ. It is evident to perception that 'air' is hot and moist, if 'air' is understood in Aristotle's sense as 'a sort of *ἀτμίς*': cf. * 22ᵇ 2–3, * 31ª 24. This is what *ἀήρ* must mean, if it is distinguished from 'fire' (i. e. the 'fiery' simple body, which is *οἷον ὑπέκκαυμα*).

30ᵇ 7–21. ἅπαντες . . . ἀντιτίθησιν: cf. * 28ᵇ 33—29ª 5. The chief object of this brief review is to confirm Aristotle's theory by showing (a) that in all previous theories the number of the 'simple bodies' depended upon the number of elementary qualities re-

cognized, and (b) that no previous theory recognized more than four 'simple bodies'.

30^{b} 11. τὰς ἀρχάς: 'originative sources', i. e. in effect *here* 'elementary qualities' (cf. e. g. 29^{b} 4, ^{b} 9), for the underlying matter is separately reckoned (30^{b} 12–13).

30^{b} 12. ἤ: 'or rather', for rarefaction is due to heat and condensation to cold (cf. * 29^{b} 34—30^{a} 4).

30^{b} 13. δημιουργοῦντα. Aristotle himself applies this term to the hot and the cold as forces manipulating the dry–moist and thus producing a consistent and definitely-shaped compound: cf. e. g. *Meteor.* 384^{b} 26, 388^{a} 27, 389^{a} 28.

30^{b} 13–19. οἱ . . . ποιοῦσιν. Aristotle here contrasts with the 'monists', and compares with one another, (i) those who postulated *from the outset* (^{b} 13 εὐθύς: for even the monists in effect assume two ἀρχαί, cf. ^{b} 11) two 'simple bodies' and (ii) those who postulated three 'simple bodies' as στοιχεῖα.

(i) The 'dualists' select, as their στοιχεῖα, two simple bodies, characterized respectively by the opposite qualities of a contrariety. As thus characterized, these two simple bodies are 'extremes': and the other supposed 'simple' bodies—the 'intermediates' or 'means' (^{b} 14 τὰ μεταξύ, ^{b} 19 τὸ μέσον)—are explained as 'blends' (^{b} 15 μίγματα ποιοῦσι τούτων), i. e. as characterized by qualities intermediate between the contraries which were assumed to characterize the 'extremes'.

'Parmenides'—i. e. the Pythagorean theory criticized in the second part of his poem (cf. * 18^{b} 6–7, * 35^{b} 16–17, * 36^{a} 1–12)—is quoted as a typical instance. In this 'dualistic' theory, Fire and Earth, characterized respectively by the hot and the cold, were selected as στοιχεῖα: and Air and Water were regarded as 'blends' of these two 'extremes'.

(ii) The second group of thinkers postulated three 'simple bodies' as στοιχεῖα. They regarded two of these as 'extremes', and the third—the *intermediate* or *middle* one—as a 'blend' of these. Hence, as Aristotle says, they only differ from the 'dualists' in that the latter 'split *the intermediate* into two', whilst they do not.

30^{b} 15–17. ὡσαύτως . . . ποιεῖ. 'The same course is followed by those who advocate *three*. (We may compare what Plato does in "the Divisions": for he makes the middle of his three kinds of substance a blend.)'

Aristotle mentioned a theory which postulated a triad of 'simple

bodies' (Fire, Earth, Air) in B. 1, without naming the author. Philoponos, as we saw (* 29a 1–2), ascribes this theory to Ion of Chios.

(i) If we accept the usual interpretation of the present passage, Plato is accused of postulating three 'simple bodies' as στοιχεῖα, and of regarding two of them as *extremes*, the third being an *intermediate* produced by blending the *extremes*. He is said to have done this ἐν ταῖς διαιρέσεσιν—an addition which increases the obscurity of the passage.

According to Philoponos (p. 226, ll. 17 ff.), Alexander said that 'the reputed διαιρέσεις of Plato is a spurious work, but Aristotle is probably referring to the *Sophist*, διαιρέσεις καλῶν τὰ ἐν ἐκείνῳ'. On this, Philoponos remarks (a) that in his day there was no work called διαιρέσεις attributed to Plato, and (b) that there is nothing in the *Sophist* connected with the theory of a triad of 'simple bodies'. Accordingly he prefers another suggestion of Alexander's, viz. that the reference is to certain ἄγραφα δόγματα of Plato, which Aristotle himself had written down (ἀπεγράφετο) under the title of διαιρέσεις (cf. also the exhaustive note in Zeller[4], ii. 2, p. 437₃).

But if we identify the διαιρέσεις with a collection of Plato's 'unwritten opinions' (whether made by Aristotle or by some anonymous writer), we are still confronted with an insuperable difficulty. For how could Aristotle have credited Plato with a theory so utterly irreconcilable with the doctrine of the *Timaeus*, without a single word of explanation? And, on the other hand, if Plato had maintained a 'triad' of this kind (or if Aristotle thought that he had done so), is it not incredible that Aristotle should have omitted to emphasize its inconsistency with the *Timaeus*? The doctrine of the 'elements' in the *Timaeus* was criticized above (cf. * 29a 13–24): yet there is not a word there, or anywhere else in Aristotle, to suggest that Plato ever put forward a different, and an incompatible, theory.

For the theory is beyond question incompatible with the *Timaeus*. It is true, no doubt, that Plato (l. c., 31 b–32 c) treats Fire and Earth as 'extremes' requiring a 'mean' to unite them. But (as he immediately proceeds to say) 'extremes' which are *solids* require *two* 'means' to unite them, and accordingly there must be two intermediate bodies (Air and Water) between Fire and Earth.

Thus the doctrine of the *Timaeus* resembles the view attributed

by Aristotle to the 'dualists': cf. * 30^{b} 13–19. Again, it is true that Plato (*Timaeus* 55 d ff.) groups Fire, Air, and Water together, as all three ultimately derived from the right-angled scalene, and contrasts them with Earth, which is derived from the isosceles (cf. * 25^{b} 19–25). And he places Air midway between Fire and Water in respect to mobility, size of corpuscles and sharpness of their edge. But there is nothing in the *Timaeus* to suggest that 'the so-called elements' are *really* στοιχεῖα, or that they are three and not four, or that Air is a μῖγμα, e.g. of Fire and Earth (cf. 29^{a} 2).

(ii) I am therefore convinced that the usual interpretation of the present passage is wrong. Aristotle is not here attributing to Plato the doctrine of a *triad of* '*simple bodies*' at all. All that he is saying is that the advocates of such a triad (e.g. Ion) made one of the three a blend of the other two, 'just as Plato ἐν ταῖς διαιρέσεσιν makes the middle a blend'.

What, then, are the διαιρέσεις in question, and to what Platonic triad is Aristotle referring?

Philoponos, supposing the διαιρέσεις to be a collection of Plato's ἄγραφα δόγματα, suggests that Aristotle is referring to *the Great* and *the Small* and to a third ἀρχή, playing the part of ὕλη, 'which Plato said was a μῖγμα of the Great and the Small'. But though Aristotle constantly refers to Plato's doctrine of 'the Great and the Small' (i.e. τὸ ἄπειρον of the *Philebus*) and 'the One' (i.e. τὸ πέρας), he always recognizes that 'the Great and the Small' play the part of ὕλη, and 'the One' corresponds to 'form' (cf. e.g. *Phys.* 187^{a} 17–18, 189^{b} 11 ff., *Metaph.* 987^{b} 20 ff.). Even Philoponos is obliged to admit that the third ἀρχή (which he identifies with ὕλη, i.e. with the ὑποδοχή) was not, according to Plato, a μῖγμα of the Great and the Small, but *that in which these were mixed.*

Since we need not suppose that Aristotle is here imputing to Plato a doctrine so inconsistent with the dialogues as that of a triad of 'simple bodies', we are no longer forced to interpret ἐν ταῖς διαιρέσεσιν as a reference to an unknown work. Nor is there any reason whatever to identify the διαιρέσεις here mentioned with αἱ γεγραμμέναι διαιρέσεις referred to in the *de Part. Anim.* (642^{b} 12). In spite of Zeller's denial (l. c.), I agree with Dr. Ogle that these 'published dichotomies' are probably the divisions in the *Sophist* and *Politicus*: but Aristotle does not attribute them to Plato by name, and in any case they need not have anything to do

with the διαιρέσεις in the present passage. The latter, I venture to suggest, are simply Aristotle's name for a famous passage in the *Timaeus* (35 a ff.), where Plato describes the formation of the Soul. Plato there works with a triad, the third member of which is produced by blending the other two. God takes (a) the Indivisible and always Self-Identical Substance (Identity) and, blending it with (b) the Substance ἡ περὶ τὰ σώματα γιγνομένη μεριστή (Otherness), produces (c) a third kind of Substance. Next, God mixes together all three, viz. Identity, Otherness, and their Blend; and having done so, divides the whole resultant Substance into parts. The division—or rather the divisions, for Plato distinguishes in the whole process two successive operations—is introduced with the words ἤρχετο δὲ διαιρεῖν ὧδε (35 b), and is elaborately described (cf. Martin, i, pp. 383 ff.). It seems likely enough that this section of the *Timaeus* should have been quoted by Aristotle as αἱ διαιρέσεις.

30^{b} 20–21. συνάγει . . . ἀντιτίθησιν. Cf. *Metaph.* 985^{a} 31 – ^{b} 3: Burnet, p. 231.

30^{b} 22. μικτά. None of 'the so-called elements' is a pure example of πρώτη ὕλη informed by a couple of elementary qualities: they are all more or less 'blends'. The terms μῖγμα, μικτόν in this chapter are not used in the strict sense of 'chemical compounds' (cf. A. 10), but simply in contrast to τὸ ἁπλοῦν, τὸ εἰλικρινές.

30^{b} 23–25. τὰ . . . ἄλλων. To each of 'the so-called elements' there corresponds a *really-simple* body, which resembles it in character, but is not identical with it. Thus, e. g., πρώτη ὕλη informed by hot–dry is not the same as fire: but it is 'fiery' in character, and is the pure simple body, of which our fire is an impure or modified form (cf. * 22^{b} 2–3).

30^{b} 25–30. τὸ . . . πυρός. Fire is to the *really-simple* body, which resembles it, as ice is to water: i. e. it is an exaggeration of it, in which its characteristic quality (*the hot*) is intensified (cf. *Meteor.* 340^{b} 23: below, * 31^{b} 24–26), just as ice is an intensification of *the cold* which distinctively characterizes water.

That is why, as Aristotle adds, neither ice nor fire play any part, as constituent materials, in the coming-to-be of living things:—though the hot–dry and the cold–moist simple bodies (the first of which Aristotle *calls* 'fire') do enter into the constitution of every ὁμοιομερές (cf. 34^{b} 31–32).

30^{b} 30–33. ὄντων . . . μέσον. This passage presupposes the

doctrine developed in the *de Caelo*: cf. Introd. § 10, * 22^{b} 2–3, * 23^{a} 6–8.

The two τόποι (30^{b} 31–32) are the ἄνω (the periphery) and the κάτω (the centre) of the sublunary sphere. Corresponding to these two regions there are two *extreme* simple bodies, viz. (i) the absolutely heavy (Earth), and (ii) the absolutely light (Fire). These two 'extremes' imply an 'intermediate' body, which Aristotle divides into two, Air and Water. Both of these are *relatively* both light and heavy; for Air πλὴν πυρὸς πᾶσιν ἐπιπολάζει, and Water πλὴν γῆς πᾶσιν ὑφίσταται (cf. *de Caelo* 312^{a} 25–27).

Accordingly Fire and Air are here reckoned as forms of the body which moves towards the 'limit', i. e. towards the periphery (^{b} 32 τοῦ πρὸς τὸν ὅρον φερομένου, sc. σώματος); and are contrasted with Water and Earth as forms of the body which tends towards the centre.

In ^{b} 31 the best reading is ἑκάτερα. 'The simple bodies, since they are four, fall into two pairs which belong to the two regions, each to each.' Bonitz seems to be right in taking τοῖν δυοῖν as dependent on ἑκατέρου. The reading πρώτων (instead of τόπων) in EJΦ^{1} (cod. Z) is implied also by Γ's 'duorum utique primorum esse unumquodque'. Perhaps it was originally a gloss to explain what τόποι Aristotle meant.

30^{b} 33 – 31^{a} 1. καὶ ἄκρα . . . ἀήρ. Fire and Earth (i.e. the *really-simple* bodies which resemble these) exhibit their respective tendencies to movement, up and down, in the extreme or purest form. Hence they are grouped together as 'extremes', and contrasted with Air and Water.

31^{a} 1–3. καὶ ἑκάτερα . . . συνέστηκεν. Aristotle reverts to the previous grouping (30^{b} 31–33) of Fire and Air on the one hand, and Water and Earth on the other.

Philoponos rightly regards 31^{a} 2–3 (ταῦτα γὰρ . . . συνέστηκεν) as an explanation of how the simple bodies, although they are οὐσίαι, can be said to be 'contrary' to one another (cf. e. g. *Categ.* 3^{b} 24–25). The contrariety depends on the elementary qualities which constitute them. Cf. also 35^{a} 6.

For παθημάτων (^{a} 3), cf. e.g. 29^{b} 15 πάθος.

31^{a} 3–6. οὐ μὴν . . . ξηροῦ. In the *Meteor.* (cf. e. g. 382^{a} 3–4) Water is treated as, of all the simple bodies, most typically exemplifying τὸ ὑγρόν: and Aristotle builds his classification of the ὁμοιομερῆ upon this assumption. He classifies them in three groups, according as their matter—which must be a temperament

of ὑγρόν and ξηρόν (cf. * 29^{b} 30–32)—is *predominantly* Water, *predominantly* Earth, or *equally* Earth and Water.

Yet here (31^{a} 4–5 ὕδωρ . . . θερμοῦ) he appears to view Air as more ὑγρόν than Water. Now, so far as the definition of τὸ ὑγρόν is concerned, Air might well be regarded as more ὑγρόν—i. e. as less determinate in its outlines—than Water: and so Philoponos (p. 230, ll. 29–30) explains this passage. But this interpretation is inconsistent with the doctrine of the *Meteorologica*: cf. also below, * 34^{b} 34—35^{a} 3.

It may perhaps be suggested that Aristotle does not say here—his words do not even *necessarily* imply—that Air is more ὑγρόν than Water. He is not comparing the simple bodies *with one another*. His immediate purpose is to insist that, within the couple of qualities characterizing each 'element', one quality is more distinctive of the 'element' than the other. Thus, though Water is ψυχρόν–ὑγρόν, it is *par excellence* characterized by cold rather than by moist: and though Air is ὑγρόν–θερμόν, it is *par excellence* characterized by moist rather than by hot.

B. 4

31^{a} 7—32^{a} 2. Ἐπεὶ . . . εἴρηται. All the simple bodies are by nature such as to be transformed into one another (**31^{a} 7–21**). This transformation occurs in various ways. The quickest and easiest method is for an 'element' to pass into the 'element' next to it in the natural series—i. e. Earth into Water, Water into Air, Air into Fire, and Fire into Earth. The transformation is then effected by the conversion of a single elementary quality into its contrary (**31^{a} 21 – ^{b} 4**). The slowest and most difficult transformation is that by which a single 'element' passes into another 'element' characterized by qualities the contrary of its own—i. e. Earth into Air, Air into Earth, Fire into Water, Water into Fire. For two elementary qualities have here to be converted into their contraries (**31^{b} 4–11**). There is a third method, by which two 'elements' taken together, *provided they are not 'consecutive'*, pass (by the elimination of a single quality in each) into either one of the remaining 'elements'. Thus Fire + Water are transformed into Earth or into Air, according as *either* the hot and the moist *or* the dry and the cold are eliminated: and Air + Earth are transformed into Fire or Water by the elimination *either* of the moist and the cold *or* of the hot and the dry (**31^{b} 12–26**). But this method of transformation does not apply if the two 'elements', which are

taken together, are next to one another in the natural series. No third 'element' can be thus generated from Fire + Air, Air + Water, Water + Earth, or Earth + Fire. For the elimination of one elementary quality in each member of these pairs will leave *either* two identical *or* two contrary qualities—i. e. qualities incapable of constituting a simple body (**31^{b} 26–36**).

31^{a} 7. διώρισται πρότερον. The reference is probably neither to 14^{b} 15–26, nor to 29^{a} 35, but rather to *de Caelo* 304^{b} 23 ff. Aristotle had there maintained (a) against Empedokles, who said that the 'elements' were ἀΐδια (cf. * 15^{a} 4–8), and (b) against Plato, who denied that Earth comes-to-be out of the other three (cf. *Timaeus* 54 b–d), that all four simple bodies come-to-be out of, and pass-away into, one another. He had also criticized the accounts given by Demokritos and the Platonists of the manner in which the 'elements' are transformed.

31^{a} 8–10. ἅμα . . . ἐστιν. Apparently the argument is:— 'Perception attests the γένεσις of the "elements". For ἀλλοίωσις is an undeniable fact of perception (cf. 14^{b} 13–15): and ἀλλοίωσις is the change of a *tangible* (cf. * 29^{b} 7–13) body in respect to its αἰσθητὰ πάθη (cf. e. g. * 19^{b} 8–10). Hence the observed fact of ἀλλοίωσις implies change in the πάθη of the ἁπτά.'

If this be the argument (cf. also 14^{b} 15–26), it is clearly very weak. The πάθη of the ἁπτά include not only the *derivative* as well as the *basal* contrarieties of touch, but also the qualities of colour, sound, flavour, and scent. And even if Philoponos (p. 232, ll. 6–12) is right in suggesting that all these πάθη are effects of the various blendings of *the hot* and *the cold*, and *the dry* and *the moist*, still the fact of ἀλλοίωσις does not prove that the 'elements' come-to-be. For ἀλλοίωσις does not imply, in every instance, a change from cold to hot, or dry to moist, or *vice versa*. *At most* ἀλλοίωσις implies *some* modification in these basal contrarieties of touch, and shows therefore that the γένεσις of the 'elements' is *possible*.

31^{a} 24. σύμβολα. According to Liddell and Scott, σύμβολα 'were strictly the two pieces of a bone or coin, which two ξένοι, or any two contracting parties, broke between them and preserved, *tallies*, Latin *tesserae hospitales*'. In Aristophanes' speech (Plato, *Symp.* 191 d) each of us is said to be ἀνθρώπου σύμβολον, ἅτε τετμημένος ὥσπερ αἱ ψῆτται, ἐξ ἑνὸς δύο. We are, each of us, a half severed from the original whole human being—a half demanding its complementary half to constitute a complete

ἄνθρωπος, much as a flat-fish, to judge by its appearance, requires to be joined to another flat-fish, blank underside to blank underside, to form a complete individual.

Aristotle uses the term here and elsewhere to mean a part of *one* whole, which is capable of fitting in with a complementary part so as to constitute *another* whole. Thus, e. g., *the hot* in Air can fit in with *the dry*, and thus constitute Fire: and *the hot* in Fire can fit in with *the moist*, and thus constitute Air. Hence *the hot* in Air and Fire is an interchangeable 'complementary factor'. (Cf. Bonitz, *Ind.* 715ᵇ 1–8. He renders σύμβολον by 'pars', which is hardly adequate.) Perhaps the most instructive passage is in the *Meteorologica*, where Aristotle is explaining the formation of Air. Air in the strict sense—not in the more popular sense in which Aristotle sometimes (e. g. *de Caelo* 289ª 29, *Meteor.* 340ᵇ 21–32: cf. Gilbert, p. 181_1, p. 476_3, &c.) uses 'air' to include the 'fiery' body—is a *hot–moist* body, filling the lower atmosphere, the region where ἀτμίς predominantly collects and clouds form. It is 'a sort of ἀτμίς' (* 30ᵇ 4); yet, as Aristotle maintains (*Meteor.* 360ª 21–27), καπνός—i. e. the πνευματώδης ἀναθυμίασις—as well as ἀτμίς (the ἀτμιδώδης ἀναθυμίασις) contributes to its formation. The ἀτμιδώδης ἀναθυμίασις, which, since it is drawn from the water, is really 'in its own nature' *cold* and *moist* (cf. * 22ᵇ 2–3, * 31ᵇ 24–26), supplies *the moist*, and the καπνός contributes *the hot*, ὥστε καθάπερ ἐκ συμβόλων συνίσταιτο ἂν ὁ ἀὴρ ὑγρὸς καὶ θερμός.

31ᵇ 2–4. ὥστε . . . ἐφεξῆς. Aristotle has shown that, by the conversion of a single elementary quality in each case, Fire is transformed into Air, Air into Water, Water into Earth, and Earth into Fire (31ª 26 – ᵇ 2). This is a *cycle* of transformations. At the same time, the 'elements' have been taken 'consecutively', i. e. in their natural order: for—working 'downwards' from the 'uppermost' *stratum*—Air comes next to Fire, Water to Air, and Earth to Water (cf. Introd. § 10, * 22ᵇ 2–3). Hence Aristotle says that the 'elements' taken in their natural consecution contain σύμβολα, and therefore cyclical transformation of the simple bodies is the easiest. For ἐφεξῆς, cf. *16ᵇ 4.

31ᵇ 5. ἐξ ὕδατος . . . πῦρ. ἀέρα καὶ πῦρ by *chiasmus* for πῦρ καὶ ἀέρα.

31ᵇ 11–24. αὕτη . . . πυρός. The transformation of Fire into Water or of Air into Earth, and *vice versa*, involves the 'passing-away' of both elementary qualities in each case, i. e. *their conversion into their contraries* (31ᵇ 4–11). Hence it takes a

longer time than the transformation of the 'elements' in their natural series, which involves only the conversion of one elementary quality into its contrary ($31^a 23 - ^b 4$). There is, however, a third method of transformation—though not of *reciprocal* transformation ($31^b 12–13$ *οὐκ εἰς ἄλληλα δὲ ἡ μετάβασις*)—whereby *two* '*elements*' *together* generate a third. This involves the 'passing-away' (*but not the conversion*) of one elementary quality in each of the generating 'elements', the new 'element' being formed out of the remaining two elementary qualities.

31^b 23. *ἦν* : cf. * $14^b 25–26$, * $28^b 2$.

31^b 24–26. *ὁμολογουμένη . . . γῆς.* Air (cf. * $31^a 24$) is formed out of *ἀτμίς* and *καπνός* : but this is not inconsistent with Aristotle's statement here that *καπνός* is derived from Air and Earth. For *καπνός* is a hot–dry exhalation or smoke, and it may draw its *hot* from Air and its *dry* from Earth. Cf. e. g. *Meteor.* $371^a 33 - ^b 1$ *ὅτι μὲν γὰρ ὅ τε καπνὸς πνεῦμα καὶ κάεται ὁ καπνός, φανερόν, καὶ εἴρηται ἐν ἑτέροις πρότερον.* (Since *πνεῦμα* is defined—*Meteor.* $387^a 29$—as *ῥύσις συνεχὴς ἐπὶ μῆκος ἀέρος*, Bonitz is probably right in interpreting *εἴρηται ἐν ἑτέροις πρότερον* as a reference to the present passage.) The same doctrine is implied in *Meteor.* $341^b 21–22$ (*ἔστι γὰρ ἡ φλὸξ πνεύματος ξηροῦ ζέσις*), $366^a 2–3$, $387^b 31$ ff. : cf. also *de Sensu* $443^a 27–28$; and above, $30^b 29$. At the same time, it must be remarked in general that it is extremely difficult to reconcile Aristotle's various statements about the *διπλῆ ἀναθυμίασις* (cf. * $22^b 2–3$) and about *ἀτμίς* and *καπνός* which are typical of its two forms. We must always remember that the two forms of *ἀναθυμίασις* never exist entirely apart from one another. The distinction between them is one of degree, and depends upon the relative predominance of *the dry* over *the moist*, or *vice versa* (cf. *Meteor.* $359^b 28–34$). The *ἀναθυμίασις*, in so far as it is derived from water, is relatively *moist*, and more like mist or aqueous vapour (*ἀτμιδώδης, ἀτμιδωδεστέρα*). It is 'hot', indeed, since it has been drawn from the water by the sun's heat: yet, as derived from water, it is (cf. * $31^a 24$) 'in its own nature' cold. On the other hand, the *ἀναθυμίασις*, in so far as it is drawn up from earth, is relatively *dry* and more like wind or smoke (*πνευματωδεστέρα, καπνώδης* : cf. e. g. *Meteor.* $341^b 6–18$).

31^b 27–28. *φθαρέντος . . . στοιχείων.* Probably *στοιχείων* is to be taken with *θατέρου*, not with *ἑκατέρῳ*. It will then mean 'elementary qualities' : cf. * $30^a 30$.

31^b 28. *τῶν σωμάτων*, i. q. *τῶν ἁπλῶν σωμάτων.*

B. 5

32a 3—33a 15. οὐ . . . ἔσται. On the connexion of B. 5–7 with B. 1–4, see * 28b 26—35a 23. B. 5 falls into two parts. (i) The doctrine already established—viz. that there must be four 'simple bodies', informations of a single incorporeal matter, constituted each by a couple of qualities drawn from two contrarieties, and all able to be transformed into one another—is shown to follow from a somewhat different starting-point (**32a 4 – b 5**).

(ii) It is proved that none of the 'simple bodies' can be an unchangeable origin (*ἀρχή*) of the others. None of them is a genuine *element*, none of them is—in that sense—the *ὕλη* of the 'natural bodies'. All of them are on the same level of being—derivative and changeable.

Incidentally it is proved that the transformations of the 'elements' cannot proceed *ad infinitum* in a straight line: and thus Aristotle's own doctrine, that their transformations are cyclical, is confirmed (**32b 5—33a 15**).

32a 4–5. εἰ . . . τοιαῦτα. Cf. 28b 32—29a 5. *τὰ φυσικὰ σώματα* (a 4) are, I think, equivalent here to *αἱ φύσει συνεστῶσαι οὐσίαι*, on which see * 28b 32–33.

32 6a–7. ἓν . . . γῆν. Aristotle is arguing against the theory that some one or other of the so-called 'elements' is the *ὑποκειμένη ὕλη*, of which the remaining 'elements' (and therefore *ultimately* all *φυσικὰ σώματα*) are derivative forms. *πάντα* (a 6, a 7), i. q. *πάντα τὰ ἁπλᾶ σώματα.*

32a 7–8. εἴπερ . . . τἀναντία. Here, as elsewhere (cf. e. g. 31a 14, 32b 21–22), Aristotle assumes this principle, which he had established in the *Physics* (cf. * 19b 6—20a 7), as a fundamental law of nature.

32a 8–9. εἰ μὲν . . . γένεσις. It will be *ἀλλοίωσις*, because *ex hypothesi* the persisting *ὑποκείμενον* (viz. Air) is a perceptible body: cf. e. g. * 19b 10–12. The alternative—viz. *εἰ μὴ ὑπομένει*—is not stated, because, unless Air is supposed to 'persist', it clearly could not be the *ὕλη* of the others as the theory maintains.

32a 9–10. ἅμα . . . ὁτιοῦν. 'Moreover, nobody supposes a single "element" to persist as the basis of all in such a way that, besides being Air, it is *simultaneously* Water or any other "element".'

Air (a 8–9) is supposed to 'persist', and the other 'elements' to be derived from it. This means that Air *alters* e. g. into

Water, not that Water *comes-to-be*. 'Alteration', however, implies that the Air, which has altered e. g. into Water, exhibits *some difference* from simple Air: and this leads to difficulties which Aristotle will develop immediately (^{a} 10–17). In the meantime, in the parenthesis ἅμα . . . ὁτιοῦν, he confirms his statement that the theory is bound to recognize an *alteration* of its supposed fundamental 'element'.

32^{a} 10–12. ἔσται . . . θερμότητα. Since some change is necessarily implied, and since all change is from contrary to contrary, the persisting 'element' must possess a quality contrary to a quality possessed by the 'element' into which it 'alters'. Thus e. g., if Air is to alter into Fire, we must assume a contrariety *hot–cold*, and assign one contrary (e. g. *hot*) to Fire. The Air, which has altered into Fire, will then be distinguished from the Air, which is the ὑποκειμένη ὕλη, by being *hot* Air.

The antecedent of ἧς (^{a} 11) is ἐναντίωσις, καὶ διαφορά being parenthetical and explanatory. The contrariety differentiates the ὑποκείμενον into its specific forms, each contrary characterizing a different form. It is tempting to transpose οἷον and τὸ πῦρ, but in any case we must construe τι as the subject of ἔξει.

32^{a} 12–17. ἀλλὰ . . . ἔσται. Fire cannot be 'hot Air' for three reasons. For (i) the process thus implied is 'alteration' of Air, not transformation: (ii) Air is not observed to become Fire by being heated (^{a} 13 οὐ φαίνεται): (iii) if Fire is 'hot Air', Air itself must be cold (for if we suppose Fire to revert again into its ὑποκειμένη ὕλη, Air, this will involve the conversion of *the hot* into its contrary); in other words, Fire will be both hot and cold, hot *qua* Fire and cold *qua* Air.

τὸ αὐτό (^{a} 17), sc. τὸ πῦρ: but Aristotle's argument also proves that Air must be simultaneously both cold and hot.

32^{a} 17–18. ἄλλο . . . κοινή. 'Both Fire and Air, therefore, will be something else which is the same; i. e. there will be some matter, other than either, common to both.' This 'other matter' is of course Aristotle's πρώτη ὕλη.

32^{a} 20–25 οὐ μὴν . . . περιέχον. Anaximander and his followers (^{a} 25, τινες) thought that all things were made out of a single 'deathless' and 'indestructible' stuff, which they called 'the Boundless' and 'the Environing': cf. e.g. *de Caelo* 303^{b} 12–13, *Phys.* 203^{b} 10–15. As the origin of all things, and as itself not characterized by any of the contraries, it is clearly 'other' than the 'elements'. And since, as Aristotle rightly interprets the

theory, 'the Boundless' is *a body*, it is natural that he should describe it as an 'intermediate' between two of the 'elements'. In several passages (cf. e.g. 28ᵇ 35) Aristotle speaks of it as intermediate between Fire and Air: in others (e.g. *Phys.* 203ª 18, 205ª 27) as intermediate between Water and Air: and in one (*Phys.* 189ᵇ 3) as intermediate between Water and Fire. Burnet (p. 55₄) rightly remarks that this variation shows we are dealing with an inference drawn by Aristotle, not with Anaximander's own statement.

32ª 20–22. οἷον . . . λεπτότερον, i. e. the ἄπειρον, if intermediate between *Air and Water*, is coarser than Air and finer than Water; if between *Fire and Air*, coarser than Fire and finer than Air (cf. *Phys.* 187ª 14–15).

32ª 22–25. ἔσται . . . περιέχον. The ἄπειρον is supposed to be a body existing apart from (i. e. unqualified by) the contraries which characterize the 'elements'. Hence the moment any of these contraries is added to it, it becomes one or other of the 'elements'. Now Aristotle maintains that it must always be qualified by one or the other of the contraries constituting each contrariety in question. For in the contrarieties which characterize the 'elements' (hot–cold, dry–moist) one contrary is related to the other as *privative* to *positive*, as στέρησις to ἕξις or to κατηγορία τις καὶ εἶδος (cf. * 18ᵇ 14–18). And though a middle is possible between two contrary judgements (for *x* may be neither hot nor cold, but insusceptible of temperature), *under certain conditions* the contrary is invested with the character of the contradictory, and the Law of Excluded Middle applies. Thus, if *x* is a subject which *can* accept the predicate 'odd', i. e. if *x* is a number, it *must* be either odd or even: for a *number*, which is not-odd, is *eo ipso* 'even'. Within the sphere of number the negation of 'odd' is *eo ipso* the affirmation of 'even' (cf. *Post. Anal.* 73ᵇ 18–24).

So the ἄπειρον, which *ex hypothesi can* accept 'hot', *must* be either hot or cold. For it must be either hot or not-hot: and a subject which is by nature recipient of heat, in so far as it is not-hot, is *eo ipso* cold. For 'cold' is simply the στέρησις of heat in a subject by nature δεκτικόν of heat. The principle of Aristotle's argument applies to 'coarse–fine', the contrariety here supposed to differentiate 'the Boundless' into Air and Water or into Air and Fire (cf. 32ª 21–23). For coarse and fine are equivalent to *dense* and *rare* (cf. * 29ᵇ 34—30ª 4), a contrariety which Anaxi-

mander regarded as primary (cf. *de Caelo* 303^{b} 10–19): and *rare* is, relatively to *dense*, a στέρησις (cf. *de Caelo* 299^{b} 8–9 ἔστι δὲ πυκνὸν μανοῦ διαφέρον τῷ ἐν ἴσῳ ὄγκῳ πλεῖον ἐνυπάρχειν). If, therefore, 'the Boundless' *can* be dense (coarse), it *must* be either dense or rare (fine): for the δεκτικόν of the dense, in so far as it is not-dense, is *eo ipso* rare.

32^{a} 25–27. ὁμοίως . . . πάντα. 'The Boundless' cannot exist apart from all contraries: and, possessing a contrary, it will be one or other of the 'elements'. Hence it is either nothing at all or any one of the 'elements' indifferently, according to the particular contrary which is at any time qualifying it. We have thus disposed of the theory that something perceptible—i. e. some *body*—exists, which is other than, and prior to, the four 'elements'. Hence the four 'elements' are all the simple bodies there are—always excepting the Aether, which is not here in question, since we are considering only the matter of the γεννητὰ καὶ φθαρτά.

32^{a} 29–30. ἢ . . . ἔγραψεν: cf. * 25^{b} 19–25 and *Timaeus* 54 b–d. Fire, Air, and Water all come-to-be out of one another, since they are all derived from the right-angled scalene. But Earth is derived from the isosceles and therefore does not come-to-be out of the other three nor pass into them.

32^{a} 31. δέδεικται πρότερον: cf. 31^{a} 12–20.

32^{a} 31–33. καὶ . . . βραδύτερον: cf. 31^{a} 20 – ^{b} 36.

In ^{a} 31 I have followed E (cf. also Γ 'et quoniam') in reading καὶ ὅτι δ', and have therefore ventured to bracket εἴρηται πρότερον in ^{a} 32 as clumsy and unnecessary. In ^{a} 32 ὅτι means 'because'.

32^{a} 34 – ^{b} 1. εἰ . . . ἀχώριστος. One contrariety produces two 'elements' only: for matter (πρώτη ὕλη) is the 'mean' between the contraries, and matter has no separate subsistence. (Or perhaps: 'for the "intermediate" is nothing but matter, and that is imperceptible' &c.)

32^{b} 5. πρότερον: above, B. 2 and 3. Cf. also *Phys.* 189^{b} 16 ff.

32^{b} 5–7. ὅτι . . . δῆλον. Aristotle is going to show that none of the 'elements' is an unchangeable originative source (ἀρχή) of the others: i. e. that all four are on the same derivative level of being.

Assuming the natural series of the 'elements' (cf. * 31^{b} 2–4), there are two 'at the end' (ἐπὶ τῷ ἄκρῳ, or ἐπὶ τοῖς ἄκροις), i. e. two 'end-elements', viz. Fire at the top and Earth at the bottom: and two in the middle, viz. Air and Water. Hence we have to prove that there can be no ἀρχή either 'at the ends' or 'in the middle'.

32ᵇ 7–9. ἐπὶ μὲν . . . πάντα. If there is an ἀρχή at one of the ends of the series, all the 'elements' (ᵇ 8 and ᵇ 9 πάντα) will be Fire or Earth. This is tantamount to saying that they all arise by alteration of Fire or Earth—a theory which has already been refuted (cf. 32ª 6–20).

It is not clear why Aristotle confines this argument to the 'end-elements'. It would apply equally—if it applies at all—whatever 'element' is selected as the ἀρχή of the rest.

The argument remains equally obscure if we interpret πάντα (ᵇ 8 and ᵇ 9) as 'all things', with Philoponos.

32ᵇ 10–12. ὅτι . . . ἄλληλα. We are to prove that no 'middle-element' can be an ἀρχή either. (ὅτι δ' οὐδὲ μέσον, sc. ἀρχή τις ἔσται αὐτῶν.) It is not true, as some thinkers suppose, that Air is transformed 'upwards' into Fire and 'downwards' into Water, and Water 'upwards' into Air and 'downwards' into Earth, whilst Earth and Fire are not further transformed into one another. In other words, we cannot maintain that the process of transformation starts from the 'middle-elements' and, proceeding upwards and downwards in a straight line, is terminated by the top and bottom 'elements' respectively.

We do not know to what thinkers Aristotle is referring. They denied the transformation of Fire into Earth and *vice versa*: i. e. they denied the *cyclical* transformation of the 'elements'. They must also have denied the transformation of Fire into Air, and of Earth into Water: otherwise (a) they could not have regarded the 'middle-elements' as ἀρχαί, and (b) they would have admitted an indirect transformation of Fire and Earth into one another.

I have marked a lacuna after ἄλληλα in ᵇ 12. The sense requires δῆλον or ἐκ τῶνδε δῆλον which can hardly be borrowed in thought from ᵇ 7.

32ᵇ 12–14. δεῖ . . . ἔσονται. Aristotle's own theory is that the transformation of the 'elements' is cyclical. He has therefore to prove (a) that none of the 'elements' can be the ἀρχή of the rest, (b) that transformation cannot *stop* at any of them, and (c) that transformation cannot start from any one and proceed *ad infinitum* in a straight line upwards or downwards.

He sets out to prove the last thesis (c) first: cf. 32ᵇ 30–32. But the actual proof is postponed to a refutation of the theory that the 'middle-elements' are ἀρχαί and that transformation, starting from them, stops at the extremes. Aristotle argues (32ᵇ 14–30) that the transformations which this theory accepts

(e.g. from Air to Fire and Water) imply the possibility of the reverse transformations also, e.g. of Fire into Water (cf. ^{b} 24–25), and thus ultimately of all the 'elements' into one another.

32^{b} 14–15. γῆ . . . Π. We need not attempt to reconstruct Aristotle's diagram, traces of which seem to be preserved in J. The argument is clear without the letters.

32^{b} 15–16. εἰ . . . Α Π. The words καὶ Υ (^{b} 16) are not strictly relevant; for the consequence (viz. that there must be a contrariety belonging to ἀήρ and πῦρ) follows from the transformation of Air into Fire alone. Air's transformation into Water (Υ) is dealt with below (^{b} 17–19).

32^{b} 20–24. οὐκοῦν . . . ξηρότης. Air, we have supposed, *qua* white changes into Fire *qua* black: and Air *qua* dry changes into Water *qua* moist. Now, in this second transformation, what happens to Air's *whiteness*? It must either persist or change; and if it changes, it must be converted into its contrary, black. Hence Water, besides being moist, must also be either white or black. It does not matter which alternative we adopt: for Aristotle's conclusions would follow equally, *mutatis mutandis*, from either. For the sake of argument, he supposes (^{b} 23) that Air's whiteness *persists* when it is transformed into Water. Water, therefore, will be moist and white. On the same principle (^{b} 23–24) we must suppose that Fire, besides being black, is also dry, Air's dryness persisting when it is transformed into Fire.

32^{b} 24–27. ἔσται . . . λευκόν. We saw *first* that Fire was black (^{b} 16–17) and Water moist (^{b} 17–19). *Next* we saw that Water was also white (^{b} 20–23) and Fire also dry (^{b} 23–24). Hence Fire is black–dry, and Water is moist–white. Therefore, since Fire and Water possess contrary qualities, Fire can be transformed into Water.

32^{b} 28–30. καὶ ἐπί γε . . . πω. In Aristotle's diagram, A (Air) has been taken as white–dry, Π (Fire) as black–dry, and Υ (Water) as white–moist. Hence it is clear 'that, in the instances we have taken, Γ (Earth) also will contain the remaining two "complementary factors", viz. the black and the moist: for these have not yet been coupled'.

32^{b} 30–32. ὅτι . . . τῶνδε: cf. * 32^{b} 12–14.

32^{b} 32—33^{a} 1. εἰ . . . τὸ Ψ. We must bear in mind, as Philoponos rightly observes, that Aristotle throughout assumes the transformations to proceed in a straight line. Only on this

assumption is it true that each new transformation implies a new contrariety, and that the preceding 'elements' must possess contrary qualities corresponding to all the contrarieties. On Aristotle's own theory, the contrariety dry–moist (e. g.) is the basis of *two* transformations, viz. of Fire into Air (or *vice versa*) and of Water into Earth (or *vice versa*). But, according to the theory which Aristotle has in mind in his present criticism, a 'middle-element'—e. g. Air—is transformed 'upwards' *in virtue of one contrariety* into Fire and *in virtue of another contrariety* 'downwards' into Water. Fire, again, is supposed to be transformed 'upwards' into a totally new 'element' (^{b}33 εἰς . . . ἀνακάμψει, i. e. the new 'element' cannot be reached either by cyclical transformation or by reversion in a straight line): the basis of this transformation, therefore, must be a totally new contrariety. And since we cannot suppose that Fire suddenly develops the contrary in question out of nothing, we must assume that this contrary has been passed on to Fire from Air and from all preceding 'elements' (if there are any) in the straight line of 'upward' transformation.

33^a 1–7. τὸ δὴ Κ . . . ὑπάρξουσιν. If Π (Fire) is transformed into a new 'element', Ψ, this implies a new contrariety, e. g. ΚΦ, of which one contrary (e. g. Κ) belongs to Fire and the other (Φ) to Ψ. Since Κ cannot have emerged from nowhere (see preceding note), it must have been passed on to Fire from the 'element' out of which Fire itself came-to-be, i. e. Κ must belong to Air and to the preceding members of the series (if any there be). The same argument applies, if Ψ be further transformed into another new 'element': hence if the transformation continues *ad infinitum*, there must be an infinity of contrarieties (i. e. an infinity of contrary qualities) in each single 'element'.

In 33^a 1–3 (τὸ δὴ Κ . . . ἄλληλα) Aristotle begins a different argument, which is dropped because it assumes that all the 'elements' (Earth, Water, Air, Fire) are transformed into one another. This assumption admits *cyclical* transformation and is therefore incompatible with the theory which he is criticizing. Hence, though Aristotle has *in fact* proved that his opponents are bound to admit cyclical transformation (* 32^b 12–14, 32^b 15–30), he is ready, for the sake of argument, to suppose (33^a 3) that the transformation of all the 'elements' into one another has not yet been proved.

33^a 9–10. τοσαύτας . . . πλείους. 'It will have to pass through

such a vast number of contrarieties—and indeed even more than any determinate number.' So Philoponos interprets, apparently rightly.

33ª 10–13. ὥστ' . . . ἐναντιότητες. (i) Some 'elements' will never come-to-be at all, viz. those which are separated from the 'element', with which the process of transformation starts, by an infinite number of intervening 'elements'.

(ii) Even the transformation of e. g. Air into its next neighbour, Fire, will be impossible. For (cf. 33ª 3–7) Air and Fire will each contain an infinite number of qualities, corresponding to the infinite number of contrarieties demanded by the infinitely-extended line of transformations. But it is impossible for a thing *with an infinite number of qualities* to come-to-be or (we might add) to pass-away. Hence Air will never pass-away and Fire will never come-to-be.

33ª 13–15. γίνεται . . . ἔσται. Aristotle's argument here appears to be unsound. He has proved (cf. * 33ª 1–7) that each new 'element' *above* Fire in the 'upward' line of transformation implies a new *contrariety*: and from this it follows that a *contrary* from each new contrariety must belong to all the 'elements' *below* Fire. Similarly, if we suppose the line of transformation to be reversed, each new 'element' *below* Fire in the 'downward' transformation implies a new *contrariety*, a *contrary* from which must belong to all the 'elements' *above* Fire.

But it does not follow from this that the elements above and below Fire are identical, since they will not all have the same *contraries* (i. e. qualities). If e. g. Fire *qua* K changes into Ψ *qua* Φ, all the 'elements' *below* Fire will possess the contrary K: whilst Ψ, and all the 'elements' *above* it, will possess the contrary Φ.

What Aristotle says is that 'all the *contrarieties* of the "elements" above Fire must belong to the "elements" below Fire, and *vice versa*': but we cannot infer from this that the 'elements' are identical. The *contrarieties* hot–cold and dry–moist belong to Earth, Air, Fire, and Water on Aristotle's own theory: but these 'elements' are not on that account 'all of them one'.

B. 6–7

33ª 16—34ᵇ 30. Θαυμάσειε . . . τἆλλα. On the connexion of these two chapters with B. 1–4, see * 28ᵇ 26—35ª 23. They may

be summarized as follows. (i) If the 'elements' are incapable of transformation—i. e. ultimately-distinct kinds of matter, 'eternal' (as e. g. Empedokles maintained)—they cannot be quantitatively compared. Hence Empedokles had no right to say they were all *equal* (33ª 16–34). (ii) There follows a general attack on the theory of Empedokles. (a) He cannot recognize growth, but only increase by addition or apposition (33ª 35 – ᵇ 3). (b) He cannot explain the γένεσις and the perpetuation of the various types of compound natural bodies. He recognizes, indeed, that if the consilience of the 'elements' is to form a definite compound (e. g. bone), it cannot be 'fortuitous', but must be governed by a certain 'proportion'. But he does not explain what causes this 'proportional consilience' (33ᵇ 3–18). (c) Nor does he see that the 'excellence' and the 'good' of each compound natural body are not due to the 'mingling', but to the cause determining the proportion in which the 'elements' are 'mingled' (33ᵇ 19–20). (d) His account of motion is abstract, inadequate, and inconsistent (33ᵇ 22—34ª 9). (e) His theory leaves psychical phenomena and psychical changes inexplicable (34ª 9–15).

(iii) The formation of compounds (the ὁμοιομερῆ) out of the 'elements' presents a serious difficulty not only for theories like that of Empedokles, but even for theories which (like Aristotle's) admit transformation of the 'elements' and recognize the genuine emergence of a new product out of two or more constituents.

For (a) how are we to distinguish the coming-to-be of a compound out of two or more 'elements' from the coming-to-be of one 'element' out of another? And (b) what is *combination*? How can *x* and *y combine* to form a *z*, which is neither *x* nor *y*, nor the indeterminate *substratum* of both, but a compound in which *x* and *y* are modified and fused? (34ª 15 – ᵇ 7).

In solving these problems, Aristotle explains how he conceives the action–passion of contrary on contrary in the process of combination which issues in the formation of a ὁμοιομερές (34ᵇ 8–30).

33ª 19–20. ταῦτα . . . πάντα: Empedokles, fr. 17, l. 27 (Diels, p. 179). In the same fragment Strife is said to be ἀτάλαντον ἀπάντῃ, and Love ἴση μῆκός τε πλάτος τε (ll. 19, 20).

33ª 20–23. εἰ . . . αὐτῷ. If the 'elements' are comparable in amount or in bulk (ª 20 κατὰ τὸ ποσόν, sc. συμβλητά), there must be something common to them—an identical something which, e. g. as Air, has ten times the bulk that it has as Water. But if so,

the way is at once open for the transformation of Air into Water and *vice versa*.

33ª 23–27. εἰ δὲ . . . δύναταί τι. Empedokles' 'elements', since they are incapable of transformation (cf. * 15ª 4–8), are not 'quantitatively comparable' in the sense e. g. that ten κοτύλαι of Air result from one κοτύλη of Water. But can we compare them quantitatively in respect to their powers-of-action? Can we measure e. g. the cooling power of Air and Water, and equate one κοτύλη of the latter with ten of the former in this respect? Aristotle answers this question in the negative; see the next note. For the meaning of δύναται (and δυνάμεις, ª 28, 32), cf. * 27ᵇ 22–31.

33ª 27–34. εἴη . . . λόγον. When A : B : : C : D, A and C, *even if they belong to entirely different 'kinds'*, are 'one' or 'the same' κατ' ἀναλογίαν (or ἀναλογίᾳ). Thus, if the spring is to the river as the heart is to the animal, the spring is ἀναλογίᾳ 'one' with the heart. They are comparable in so far as they fulfil corresponding functions in their respective spheres (cf. Alexander's commentary on *Metaph.* 1016ᵇ 34–35). So (*Eth. Nic.* 1096ᵇ 28–29) if vision is in the body what intelligence is in the soul, vision and intelligence are ἀναλογίᾳ 'the same' and may both be called 'good' in 'the same', i. e. in a corresponding, sense.

Now suppose that the heat of one 'element' corresponds to the whiteness of another, so that 'the first is hot as the second is white', the two δυνάμεις (heat and whiteness) will be comparable κατ' ἀναλογίαν, though they, and the 'elements', may remain irreducibly different. For the comparison is not quantitative and does not imply the presence of anything identical (any common unit of measurement) in the comparables. Empedokles, therefore, might consistently have said that the 'elements' were comparable *as qualia* in respect to their 'powers'. This would mean that the qualities of the 'elements' corresponded to one another; e. g., that *as* it is the function of Fire to burn, *so* it is the function of Water to cool. And Empedokles would be entitled to say that the 'elements' were all ὅμοια, 'analogous' or 'similar'. The four terms in such an ἀναλογία are treated simply as *qualia*, not as *quanta*: and the identity of the λόγος between each pair signifies therefore mere 'similarity', not 'equality' (cf. ª 29–30 τὸ δ' . . . ἴσον).

But Empedokles said that the 'elements' were all *equal*. Now it is only when the terms in an ἀναλογία are *quanta* that the

'correspondence' signifies equality. If 2 : 4 :: 8 : 16, then we may speak of the identity of the λόγοι as an 'equality' (for $\frac{2}{4}=\frac{8}{16}$) or again of 2 and 8 being 'equally' related to their respective partners, for the relation is in each case a half. Empedokles, therefore, must be contending that the 'elements', although irreducibly different, are quantitatively comparable *in respect to their powers-of-action* (see preceding note: and cf. *Meteor.* 340ª 13–17, where the unnamed thinker is rightly identified with Empedokles by Alexander).

But quantitative comparison in this sense (i. e. 'equating') is incompatible with the 'unchangeableness' of the 'elements'. For we cannot *thus* compare *disparate* δυνάμεις, or *irreducibly different* qualities (e. g. hot with white, or hot with cold). The terms in the ἀναλογία, if they are to be *thus* compared, must be *different amounts of the same.* We shall be dealing simply with one κοτύλη and ten κοτύλαι of cooling substance (cf. 33ª 25), or with so-much and many-times-as-much hot substance (cf. 33ª 32–33). The qualitative differences of Air and Water, or of Fire and Air, cannot come into the ἀναλογία at all. What we really have is:— '*one pint* exhibits *x* degrees of heat or cold: how many degrees will *ten pints* exhibit?' And the only possible answer is 'ten times *x*': i. e. the λόγος will not be *equal,* but *greater* (33ª 34 τοιοῦτον, sc. πλείω or μείζω).

33ª 30–34. ἄτοπον . . . λόγον. 'Thus it is manifestly absurd that the simple bodies, though not transformable, are comparable not merely as "corresponding", but by a measure of their powers; i. e. that so-much Fire is comparable with many-times-that-amount of Air, as being "equally" or "similarly" hot. For the same thing, if it be greater in amount, will, since it belongs to the same kind as the thing of less amount with which it is being compared, have its *ratio* correspondingly increased.'

33ª 32–33. ἴσον . . . ὁμοίως. I have followed the reading of EJ (cf. Φ): but I suspect that Aristotle wrote *either* ἴσως θερμὸν ἢ ὁμοίως *or* ἴσον ἢ ὅμοιον.

33ª 35 – ᵇ 3. ἀλλὰ . . . αὐξανόμενα. On Aristotle's conception of 'growth', see A. 5 and * 20ᵇ 34—21ª 29. Aristotle himself applies the term metaphorically to the spreading of fire, cf. * 22ª 15. The quotation from Empedokles is given as fr. 37 by Diels (p. 186: cf. p. 686) who quotes Lucretius, ii. 1114 ff., in support of δέμας (HJ) against γένος (EFL).

In Empedokles αἰθήρ means 'Air', not 'Fire' (cf. Burnet,

pp. 228–229), as Aristotle is well aware: cf. * 34ª 3. That 'Fire increases by Fire', therefore, must be derived from a lost verse of Empedokles, unless it is merely an inference of Aristotle's own.

The *first* αὔξει (33ᵇ 1) is probably intransitive, although the *second* is transitive. Aristotle would hardly have said 'Empedokles increases Fire by Fire'.

33ᵇ 4–9. τὰ . . . ἐλαίαν; The γένεσις of things which come-to-be by a natural process is uniform: and the uniformity is either absolute or highly regular. Breaches of the uniformity, when they occur, are not attributed to φύσις as their cause, but to chance. The problem therefore, which Empedokles ought to solve, is:—'What determines this uniformity in the γένεσις of natural products?'

In ᵇ 5 ὠδί (which EFL omit) is necessary: cf. the corresponding formula (*Phys.* 196ᵇ 10–11) ὁρῶμεν τὰ μὲν ἀεὶ ὡσαύτως γινόμενα τὰ δ' ὡς ἐπὶ πολύ.

The meaning of τὸ αὐτόματον and τύχη, and the distinction between them, are discussed in the *Physics* (195ᵇ 31—197ᵇ 37). The distinction is irrelevant here, and Aristotle mentions both only in order to cover all possible cases. Thus at 34ª 2 he employs the term τύχη, though (according to the distinction as drawn in the *Physics*) he ought to have spoken of τὸ αὐτόματον.

With 33ᵇ 3–18, and again with 34ª 9–15, the reader should compare *de Anima* 408ª 18–23 and 409ᵇ 23—410ª 22.

33ᵇ 9–11. ἢ . . . τινί. The distinction between *fortuitous* and *proportionally determinate* 'consilience of the elements', and the explanation of the formation of bone by a mingling of the 'elements' in a certain proportion, are ascribed to Empedokles elsewhere; cf. *Metaph.* 993ª 17, and *de Anima* 410ª 1–6 where Aristotle quotes the first three lines of fr. 96 (Diels, p. 199).

We must therefore refer to Empedokles the suggestion that bone results ἐὰν ὠδὶ συντεθῇ (ᵇ 9): and we must regard καθ' ἃ ἐκεῖνός φησιν as covering the whole sentence οὐ . . . τινί (ᵇ 9–11).

33ᵇ 11. τούτου, sc. τοῦ λόγῳ τινὶ συνελθόντων γίγνεσθαι. The singular is required by the sense of the passage.

33ᵇ 12–13. ἀλλὰ . . . αἴτιον. According to Empedokles, Love 'associates' and thus causes the union of all things in the 'Sphere'; whilst Strife 'dissociates' and thus breaks up the 'Sphere'. But Aristotle (cf. *Metaph.* 985ª 21–29, 1000ª 24 – ᵇ 12, &c.) points out that Love, in bringing all things together, destroys

the individuality of each: and that Strife, in 'dissociating', brings into distinctive being the various constituents of the universe (cf. * 15^{a} 8–11: Burnet, pp. 232–233).

The same criticism is clearly in Aristotle's mind at 33^{b} 20–22 (*καίτοι . . . ταῦτα*): perhaps, therefore, we ought to read that sentence immediately after *αἴτιον* (^{b} 13).

33^{b} 13. τοῦτο, sc. the cause of the 'proportional consilience' to which Empedokles attributes the *γένεσις* e. g. of bone.

33^{b} 14–15. ἀλλ' . . . φησιν. Empedokles, fr. 8 (Diels, p. 175): cf. next note, and * 14^{b} 7–8.

33^{b} 15–16. τύχη . . . ἔτυχεν. According to Empedokles, fr. 8 (cf. the paraphrase in *MXG.* 957^{a} 36 – ^{b} 16), what is supposed to be *coming-to-be* or *death* is really 'only a mingling and a divorce of what has been mingled: but it is called *coming-to-be* amongst men'. Aristotle is here *parodying* the last line of this fragment, *φύσις δ' ἐπὶ τοῖς ὀνομάζεται ἀνθρώποισιν.* He reminds us of the original by the mere sound of the phrase (*ἐπὶ τοῖς ὀνομάζεται*), of which he has entirely altered the construction and the meaning.

'And *chance*, not *proportion*, is the name given to these occurrences', viz. to *μίξις* and *διάλλαξις μιγέντων.*

For the idiom, *ὀνομάζεσθαι ἐπί τινι*, see Stallbaum's note on Plato, *Rpc.* 470 b and the passages there quoted.

33^{b} 15. ἐπὶ τοῖς ὀνομάζεται. I have restored *τοῖς* from J's *τὸ ἴσον* (cf. Γ 'ad equale nominatur'), which arose from the reduplication of the first syllable of *ὀνομάζεται.* Instead of *τοῖς*, FHL have *τούτοις* and D^{b}E *τούτων.* But in E *ων* is corrected out of an earlier reading and *οις* is written above it.

33^{b} 16–20. τῶν . . . ἐπαινεῖ. Cf. 35^{b} 6–7, where Aristotle says that the final cause of the things that come-to-be is *ἡ μορφὴ καὶ τὸ εἶδος· τοῦτο δ' ἐστὶν ὁ λόγος ὁ τῆς ἑκάστου οὐσίας.*

'The formula expressing the essential nature' of a *ὁμοιομερές* (like bone) is the *λόγος τῆς μίξεως* of its constituents (cf. * 14^{a} 19), i. e. the scheme of proportions constituting the plan of the combination. This 'combining-formula' (a) adequately expresses the 'form' (and is therefore the scientific definition) of the *ὁμοιομερές*; and (b) states the normal or perfect development of the *ὁμοιομερές*, its *φύσις* in the sense of *τὸ τέλος τῆς γενέσεως* (cf. e. g. *Metaph.* 1015^{a} 10–11), i. e. its 'good'.

The basis of the doctrine is Plato's *Philebus*, e. g. 25 d–26 d, 64 c–65 a.

33^{b} 17. τὸ οὕτως ἔχειν, sc. being a compound such that the

consilience of its constituents has been governed by a certain proportion and not by chance.

33^{b} 18. οὐδὲν . . . λέγει : an allusion to the title of Empedokles' poem. His work Περὶ φύσεως tells us nothing about Nature.

33^{b} 19–20. ὁ . . . ἐπαινεῖ. Cf. *Metaph.* 984^{b} 32—985^{a} 10, where Aristotle says that 'Empedokles, though he expressed himself imperfectly, really regarded Love as the cause of all the goods in the universe, and Strife as the cause of all the evils'.

Since Love brings things together, the μίξις, to which alone Empedokles ascribed the formation of the 'perfect' or 'normal' compound, is no doubt the work of Love.

33^{b} 20–22. καίτοι . . . ταῦτα : cf. * 33^{b} 12–13. According to Empedokles, Love formed the Deity (i. e. the Sphere, cf. fr. 27, 28, 29; Diels, pp. 183–184) out of the 'elements': and *then* Strife 'dissociates' it and separates out the 'elements' again (cf. * 15^{a} 4–8, * 15^{a} 15–19). The 'elements', therefore, are *prior* to the Sphere (cf. 15^{a} 25): and Empedokles (fr. 6; Diels, p. 175) gives them the names of Gods, viz. Zeus, Hera, Aidoneus, and Nestis (cf. Burnet, p. 229). He also speaks of Love and Strife as δαίμονες (fr. 59; Diels, p. 190).

What then is the cause of the *original* separate being of the 'elements', before Love had 'associated' them to form the Sphere? They must, Aristotle argues (*de Caelo* 301^{a} 15–20), have been 'separated out' of some prior unity, since Love formed the Cosmos ἐκ διακεκριμένων τῶν στοιχείων : yet this original διάκρισις cannot be the work of Strife, for Strife can 'dissociate' only the already-formed Sphere.

33^{b} 22–26. ἔτι . . . πως. Aristotle proceeds (33^{b} 22—34^{a} 9) to criticize Empedokles' account of motion. He finds fault with it firstly because it is vague, devoid of scientific precision (^{b} 22 ἁπλῶς, i. q. ἀδιορίστως : cf. Bonitz, *Ind.* 76^{b} 30 ff., 77^{b} 5 ff.).

Thus, e. g., Empedokles (cf. fr. 20; Diels, p. 180) attributes the formation of organisms (plants, fish, sea-birds, beasts, man) to Love, and their dissolution to Strife. The separate limbs or organic parts come together because Love sets them moving: and the organism is disintegrated because Strife divides it.

But this is no explanation, unless indeed Empedokles means, by 'Love' and 'Strife', forces whose very nature it is to initiate respectively movements of integration and disintegration. And if that was his meaning, he ought to have adopted the recognized scientific procedure. For the man of science explicitly assumes

the 'that' and the 'what' (the 'being' and the 'nature') of the substances which he proves to contain certain essential properties: and he explicitly assumes the 'what' (i. e. the meaning) of the properties whose inherence he demonstrates. In other words, the man of science either *defines* or *posits* or *demonstrates* the constituents of his subject-matter. (For the doctrine of the *Posterior Analytics*, which Aristotle is here assuming, and for the functions assigned to ὁρισμός and ὑπόθεσις in the logical structure of a 'science', see Introd. §§ 7–9.) If, therefore, Empedokles' account of motion had been precise, he would not have been content to say that 'Love and Strife set things moving' (^{b} 23 διότι, i. q. ὅτι: cf. 37^{a} 15; Bonitz, *Ind.* 200^{b} 39 ff.). He would either (i) have stated explicitly 'I assume that there is a force—viz. Love—whose nature it is to initiate *such-and-such* a movement, and another force—viz. Strife—whose nature it is to initiate *such-and-such* a movement'; or (ii) he would have demonstrated that 'to bring together' and 'to force asunder' are 'properties' which must characterize Love and Strife respectively.

33^{b} 25–26. ἢ ἀκριβῶς . . . πως. These alternatives qualify ἀποδεῖξαι. Perhaps we have no right to demand an exact demonstration, like that of the mathematician, in the sphere of φυσική. But Empedokles ought to have attempted *some* kind of proof:—an inference from consequent to ground, or (e.g.) a dialectical proof.

Bekker's conjecture (^{b} 26 ἀμῶς for ἄλλως) is tempting at first sight: but it does not really solve the difficulty. For presumably we must identify (i) the *exact* demonstration with ἀπόδειξις τοῦ διότι, and (ii) the *laxer* demonstration with ἀπόδειξις τοῦ ὅτι (cf. *Post. Anal.* 78^{a} 22 ff.). Besides these two ways of demonstrating no other way is left: for the probable reasoning of the dialectician, to which Aristotle appears to be referring, is not ἀπόδειξις at all. Hence Aristotle's language remains inaccurate, whether we read ἄλλως γέ πως ('in some other way') or ἀμῶς γέ πως ('in some way or other').

33^{b} 26–33. ἔτι . . . μᾶλλον. I (^{b} 26–30). There is natural, as opposed to compulsory or unnatural, movement. For (a) the 'simple' bodies *appear* to move in two different ways, viz. 'by compulsion' and 'naturally': (b) these two kinds of movement are contrary to one another, and (c) 'compulsory' movement *actually occurs* (i. e. according to Empedokles himself, as Aristotle infers from his statements: cf. Bonitz). Hence its contrary, 'natural' movement, must also occur in fact.

II (^{b} 30–33). Is Love the cause of the *natural* movement (^{b} 30 *ταύτην*, sc. *τὴν κατὰ φύσιν*) of the 'simple' bodies? From what Empedokles says (when e.g. he ascribes the formation of organisms to Love, fr. 20) we should expect an affirmative answer to this question. Yet in fact, it would seem, the answer must be 'No' (^{b} 30 *ἢ οὔ;*). For Love brings all the 'elements' together, 'associating' them to form the Sphere: whilst Strife 'dissociates' the Sphere, moving all the 'elements' apart. Now the *natural* movement of Earth (e.g.) moves it downwards, i.e. away from the other 'elements', and thus resembles a movement of dissociation (^{b} 31 *τὴν γῆν κάτω*, sc. *κινεῖ ἡ κατὰ φύσιν κίνησις*). Hence Strife—rather than Love—seems to cause the *natural* movements: and Love—rather than Strife—is *contrary to nature.* Empedokles ought to have given to Love the epithets he applies to Strife—e.g. 'destructive' (fr. 17, l. 19; Diels, p. 178), 'evil' (fr. 20, l. 4; Diels, p. 180).

Philoponos, to judge from his paraphrase, seems to have read ^{b} 26–33 very differently: but it is not possible to infer with certainty what he had before him.

33^{b} 27. τὰ σώματα, i.q. *τὰ ἁπλᾶ σώματα*: so also ^{b} 34 (*αὐτῶν τῶν σωμάτων*), 36^{a} 1, 37^{a} 8 and 10.

33^{b} 33—34^{a} 5. ἁπλῶς . . . ῥίζαις. Since, according to Empedokles, Love and Strife are the sole causes of motion, the 'elements' have absolutely no *inherent* motion or rest (^{b} 33 *ἁπλῶς* goes with *οὐδεμία ἐστίν*). Yet this is not only a paradox, but incompatible with his own statements. For though Strife *initiated* the disintegration of the Sphere, the 'elements' were borne asunder by movements of their own. Thus Empedokles himself attributes to Fire a *natural* tendency to move upwards; and to Air a downward movement, which he contrasts with its occasional *fortuitous* motion upwards and therefore clearly regards as *natural.*

In ^{b} 34 I follow EF and read *κινεῖ*, 'unless Love or Strife are actually setting the simple bodies in motion'.

In ^{b} 35 Aristotle adds *οὐδὲ μονή*: for, according to his own theory, the 'rest' of each 'element' at its proper place is the effect of that inherent tendency to movement which constitutes its 'nature' (cf. e.g. Introd. § 10).

34^{a} 3. οὕτω . . . ἄλλως. Empedokles, fr. 53 (Diels, p. 189). The same verse is quoted in the *Physics* (196^{a} 22–23), where Aristotle substitutes *ἀήρ* for *αἰθήρ* in his explanatory paraphrase: cf. * 33^{a} 35 – ^{b} 3.

34a 4–5. πεφυκέναι . . . ῥίζαις. Empedokles, fr. 51 and 54 (Diels, p. 189). The present passage is the only source of fr. 54.

34a 5–9. ἅμα . . . ἀρχή. According to Empedokles, the Order of the World is the same *now*, in the reign of Strife, as it was *formerly* in the reign of Love (cf. * 15a 14). Hence neither Strife nor Love can be the force which first set the 'elements' moving and thus initiated the persistent Order. Strife and Love are reduced to secondary causes—causes of *this* and *that* particular kind of motion, which presuppose an originative source of motion in general. But Empedokles does not tell us what this unknown first cause of motion is.

In a 9 I have ventured to read εἴ γ' ἐστὶν ἐκεῖνο ἀρχή, 'if at least we assume that "first mover" to be an originative source of motion in general'.

34a 15. ἑτέρας . . . θεωρίας. Cf. *de Anima*, A. 4 and 5, especially 408a 18–23, 409b 23 ff., where Empedokles' failure to account for the soul is exposed very forcibly and in more detail.

34a 15 – b 7. περὶ δὲ . . . ὕλην. Aristotle is about to discuss the formation of the ὁμοιομερῆ out of the simple bodies. As a preliminary, he divides all theories into (i) those which admit, and (ii) those which deny, that the 'elements' are transformed into one another. The theories of the Pythagoreans (cf. * 34b 4) and of Aristotle himself belong to the first group: whilst the theory of Empedokles is typical of the second.

(i) Theories which admit transformation of the 'elements' into one another necessarily also regard the 'elements' as differentiations of a common *substratum*; and *vice versa* (**34a 16–18**). And (ii) the denial of the reciprocal transformation of the 'elements' is equivalent to the denial that any 'element' can come-to-be out of any 'element' *taken singly*, except in the sense in which bricks can come-to-be out of a wall. Fire, e. g., taken singly, is not transformed into any other 'element': all that Empedokles could admit, is that some other 'element' might be *extracted* out of Fire by a mechanical analysis (**34a 18–20**: the words μηδ' . . . πλίνθους are an explanatory amplification of μὴ ποιοῦσιν ἐξ ἀλλήλων γένεσιν). Such a theory will find it difficult to explain how anything—e. g. any ὁμοιομερές—can come-to-be out of *a plurality* of 'elements' (**34a 20–21**: ἐξ ἐκείνων is contrasted with ὡς ἐξ ἑκάστου). The only explanation available for Empedokles is that flesh (e. g.) comes-to-be by a mechanical synthesis; i. e. that Earth, Air, Fire, and Water 'compose' the

ὁμοιομερῆ much as bricks and stones 'compose' a wall. But this is clearly inadequate (34ª 26 – ᵇ 2).

Even for the theories of the first group there is here a serious difficulty. Water comes-to-be out of Fire, and Fire out of Water, because Fire and Water are differentiations of a common *substratum*. But how are we to account for the γένεσις of the ὁμοιομερῆ—e. g. of flesh and marrow—out of Earth, Air, Fire, and Water? (34ª 21–26). How can there be a resultant which is *neither* one of its constituents, *nor* a mosaic of them all, *nor yet* the common *substratum* of which they are the differentiations? (34ᵇ 2–7).

34ª 23–24. ἐκ . . . πῦρ. 'Water' and 'Fire' are selected merely for illustration (cf. also 34ª 32). According to Aristotle's own doctrine all four 'elements' are combined in every ὁμοιομερές: cf. e. g. B. 8, * 14ª 19, * 27ª 33 – ᵇ 6.

34ª 26 – ᵇ 2. ἐκείνοις . . . μέρους: cf. * 27ᵇ 33—28ª 17. The conception of a compound, which is ὁμοιομερές, is that of a whole formed by *chemical* combination and capable of *chemical* analysis. But theories like that of Empedokles can only offer us the conception of an aggregate, or mosaic, formed by *mechanical* synthesis and capable of *mechanical* analysis. The so-called μῖγμα or 'Sphere' of Empedokles is in fact a mere shuffle of the 'elements', in which they persist unchanged in quality, though divided into minute particles: and the same will apply to every compound, and therefore to every ὁμοιομερές, within the 'Sphere'. But this is not only contrary to the true conception of the ὁμοιομερῆ: it collides with the facts. Flesh, e. g., can in fact yield Fire and Water (and also, as Aristotle might have added, Earth and Air) from any and every part of itself. Any part of flesh can indifferently be converted into flame, into liquid, into the dry dust of putrefaction, and into 'air' or gas (cf. e. g. * 29ᵇ 24–26). But this would be impossible if flesh were a mere shuffle or mosaic. It would, indeed, be possible to extract e. g. Fire from one part of flesh and Water from another, as one can extract a stone *here* and a brick *there* from a wall: but we could not extract both Fire and Water indifferently from every part.

34ª 32–34. ὥσπερ . . . γενέσθαι. The purpose of this illustration is to explain the precise meaning of the chemical analysis which every ὁμοιομερές can undergo.

34ª 34–35. τοῦτο . . . ἄμφω. I insert τό in ª 35 before ἐκ τῆς . . .

ἄμφω, and take the clause as epexegetic of τοῦτο. Cf. Philoponos (p. 274) κατὰ τὸν αὐτὸν τρόπον, φησί, τοῦτο δὴ τὸ ἐξ ὁτουοῦν μορίου ἄμφω γενέσθαι καὶπὶ τῆς σαρκὸς συμβαίνει.

34ᵇ 4. οἷον . . . γῆς. Aristotle selects 'the cold and hot, or Fire and Earth' as examples and is probably thinking of 'Parmenides', i. e. the Pythagoreans (cf. * 30ᵇ 13–19): but the criticism applies, as he is well aware, to his own theory too.

34ᵇ 8–30. ἆρ' . . . τἆλλα. Aristotle now solves the problem and explains how the γένεσις of the ὁμοιομερῆ out of the 'elements' differs from the transformation of one 'element' into another. In the main this passage is a mere restatement of the doctrine already enunciated in A. 10 (cf. * 27ᵇ 22–31, * 28ª 29–31, * 29ᵇ 24–26), but two new features are briefly indicated. Thus, (i) ᵇ 14–16 give us a hint of the sense in which the 'elements', *qua* constituting a ὁμοιομερές, are συμβλητά: and (ii) ᵇ 27–28 indicate how Aristotle would have explained the emergence of *different* ὁμοιομερῆ from the combination of the same constituents.

Aristotle bases his solution (i) on the distinction between (a) the absolutely or 'completely' and (b) the relatively or 'more or less' hot, cold, dry, moist (ᵇ 8–16): and (ii) on the reciprocal action–passion of contraries (ᵇ 20–24).

34ᵇ 8–16. ἆρ' . . . τοιοῦτον; (a) The 'completely-hot' is not in any sense actually cold: but it is δυνάμει cold, because its *substratum* is the *substratum* also of the cold. Hence that which is completely-hot may become cold, and there is always a tendency for the *substratum* to pass from one extreme to the contrary. (b) The 'relatively-hot', on the other hand, is an 'intermediate' which is actually both hot and cold, though neither completely-hot nor completely-cold. It is the compromise, resulting from the reciprocal action–passion of a completely-hot and a completely-cold which were present in amounts approximately balanced or equal. It actually possesses the 'powers of action' which characterize both the completely-hot and the completely-cold, but in a reduced degree. It is in fact a 'tempered-hot', which relatively to the completely-hot is cold and relatively to the completely-cold is hot. Thus it is δυνάμει both hot and cold, in the sense that the heat and cold, which it actually possesses, are present in it in a reduced degree (cf., for this sense of δυνάμει, * 27ᵇ 22–31).

But the tempered-hot must not be confused with the ὕλη. The ὕλη is neither hot nor cold, but capable of becoming either.

The 'intermediate', or the tempered-hot, is both hot and cold. It is a compromise, in which the completely-hot has reduced its contrary to a relatively-cold and been itself reduced to a relatively-hot. In this reciprocal attemperament of the contraries to a compromise participating in the characteristics of both, we already have *in principle* the process which Aristotle calls μίξις (cf. ^{b} 11–12 διὰ . . . ἀλλήλων). But the γένεσις of a ὁμοιομερές out of the elementary qualities requires in addition a temperament of the dry and the moist, which is in part effected by the 'immanent' action of the tempered-hot: cf. * 29^{b} 24–26.

In 34^{b} 9–10 θάτερον is the subject: ᾗ, ἔσται are to be taken in the existential sense.

34^{b} 14–16. κατὰ . . . τοιοῦτον; An 'intermediate' can result only if the active–passive extremes were present in approximately equal amounts (cf. ^{b} 23, 28^{a} 28–31). But the 'intermediate' itself may exhibit its powers-of-heating-and-cooling in different proportions. Thus, e. g., in *one* 'intermediate' the power-of-heating will be twice as great as its power-of-cooling: in *another*, three times as great: in *others*, perhaps, one-half or one-third as great.

In other words, there is a sense in which the 'elements' *qua* constituting the ὁμοιομερῆ are συμβλητά (cf. the criticism of Empedokles, 33^{a} 16–34). The constituents of the ὁμοιομερῆ are the 'simple' bodies *qua* hot, cold, dry, and moist: and these elementary qualities form, by reciprocal action–passion, a tempered-hot and a tempered-dry. These 'intermediates' differ in the different ὁμοιομερῆ: but, though different, they are nevertheless συμβλητά, because they are definable in terms of the ratio (positive or negative) of their power-of-heating to their power-of-cooling, or of their power-of-maintaining to their power-of-adapting their outlines.

In ^{b} 14 ἢ ψυχρόν means 'than cold': similarly, ^{b} 15–16 διπλασίως . . . ψυχρόν means 'potentially-hot twice as much as it is potentially-cold'. But ἢ τοὐναντίον (^{b} 14) means 'or contrariwise', i. e. ἢ μᾶλλον εἶναι ψυχρὸν ἢ θερμόν. This possibility—viz. that the 'intermediate' may exhibit an excess of cooling-power over heating-power—is provided for at ^{b} 16 (ἢ κατ' . . . τοιοῦτον). The ratio of the heating-power to the cooling-power in an 'intermediate' may be e. g. 2 : 1, or 3 : 1, or again 1 : 2 or 1 : 3.

34^{b} 16–20. ἔσται . . . γινόμενον. Aristotle here summarizes his view of the way in which the ὁμοιομερῆ (^{b} 17 τἆλλ', i. e. all bodies

other than the 'simple' bodies, viz. all *σύνθετα*: but Aristotle is thinking primarily of the *ὁμοιομερῆ*) result from the 'elements' or the elementary qualities. At the same time, he emphasizes the distinction between (a) the *combination* of contraries, which results in the *ὁμοιομερῆ*, and (b) the lapsing of both contraries into the undifferentiated matter which is the mere potentiality of both: and thus solves the problem formulated at 34^{b} 2–7.

The contraries, or rather the 'elements' (b 17 *ἢ τῶν στοιχείων*), constitute the *ὁμοιομερῆ* in so far as they have been 'combined'. They are 'combined', when both contraries in each contrariety are preserved at a lower degree in a resultant 'intermediate'. Hence the 'elements', in so far as they are the constituents of a *ὁμοιομερές*, result from (and contain) all the contraries, these being preserved in them 'potentially'. But we must understand this 'potential being' of the contraries in a special sense (b 18 *δυνάμει πως ὄντων*), viz. in the sense which has been explained (cf. * 27^{b} 22–31, * 34^{b} 8–16). We must not suppose that the 'elements', *qua* constituting the *ὁμοιομερές*, are only 'potentially' hot, cold, dry, and moist in the sense in which the matter of these contraries is only 'potentially'—i. e. *not actually*—any of them.

This interpretation, which alone gives a satisfactory sense to the passage, forces us to take *ἐκείνων* (b 18) as equivalent to *τῶν ἐναντίων*, and to understand *τὰ στοιχεῖα* in the same line as Earth, Air, Fire, and Water, in so far as they are co-operating to form a *ὁμοιομερές*.

34^{b} 19–20. *καὶ . . . γινόμενον.* *οὕτω*, sc. in the manner described at b 10–12. *ἐκείνως*, sc. in the manner which alone was contemplated as possible in the formulation of the problem (b 6–7), viz. so that one contrary is destroyed by the other. For if the completely-hot 'passes-away', the only possible result—unless the completely-cold takes its place—is *ὕλη*.

34^{b} 20–30. *ἐπεὶ . . . τἆλλα.* Aristotle completes his account by appealing to the 'disjunctively-articulated definition' (*διορισμός*: cf. 23^{a} 22, 29^{a} 14) or 'law' of the reciprocal action–passion of contraries, which was formulated in A. 7.

One consequence of this law is that a contrary is converted into its contrary, if the latter is present in an overwhelming or 'dominant' amount (b 23 *ἐὰν μὴ ἰσάζῃ*, cf. e. g. * 28^{a} 29–31, * 34^{b} 14–16): and it is owing to a conversion of this kind that the reciprocal transformations of the 'elements' take place (cf. * 31^{a} 7—32^{a} 2).

But the formation of the ὁμοιομερῆ is another consequence of the same law. For if any two contraries are present in approximately equal amounts, their reciprocal action–passion reduces both in degree towards a 'mean', and the contraries are thus 'compromised' to form an 'intermediate' (cf. * 29^{b} 24–26, * 34^{b} 8–16).

34^{b} 20–28. ἐπεὶ . . . οὐδέτερον. The protasis extends to ^{b} 24 ἐναντίων. By that time Aristotle has forgotten that he began the sentence with ἐπεί, and the apodosis (καὶ πρῶτον κτλ.) is introduced as an independent sentence.

34^{b} 24–26. καὶ πρῶτον . . . τοιαῦτα. There is no expressed εἶτα, but it is implied. Aristotle is of course referring to two different consequences of the action–passion of contraries (cf. * 34^{b} 20–30), not to two temporally successive stages in the γένεσις of the ὁμοιομερῆ.

34^{b} 27–28. ἐνταῦθα . . . οὐδέτερον. ἐνταῦθα, sc. at the μέσον. The tempered-hot is neither completely-hot nor completely-cold (cf. * 34^{b} 8–16).

34^{b} 28. τὸ . . . ἀδιαίρετον. The diversity in the 'intermediates' (cf. * 34^{b} 14–16), on which the difference of the various ὁμοιομερῆ depends, is due to the fact that 'the mean' is a 'stretch' or a 'scale', not 'punctual' or a 'point'. The contraries can be 'compromised', so as to form an 'intermediate', at various degrees along a scale, or anywhere along a certain stretch.

For this familiar Aristotelian conception of a μέσον which is capable of fluctuation within certain defined limits, cf. *Eth. Nic.* e. g. 1106^{a} 26–32, 1106^{b} 36—1107^{a} 2, 1173^{a} 23–28.

34^{b} 29. καὶ τὰ τοιαῦτα. Since no contraries except the hot and the cold, and the dry and the moist, contribute to the formation of the ὁμοιομερῆ, we must refer τὰ τοιαῦτα to the hot and the cold: 'as well as the contraries we have used as examples'.

B. 8

34^{b} 31—35^{a} 23. Ἅπαντα . . . εἴρηται. All the ὁμοιομερῆ must contain all four 'elements' as their constituents (34^{b} 31—35^{a} 9). This is confirmed by the fact that all living things—even plants—require at least two 'elements' as their food (35^{a} 9–14). A note is added to explain why Fire, alone of the 'simple bodies', is said to 'be fed'; and the part played by Fire in the make-up of the ὁμοιομερῆ is indicated (35^{a} 14–21).

34^{b} 31–32. Ἅπαντα . . . ἐστίν. Since there are no μικτὰ (i. q. μιχθέντα, cf. 28^{a} 4) σώματα except in the sublunary sphere, we

must translate: 'All the compound bodies—all of which exist in the region belonging to the central body—are composed of' &c.

The central body (τὸ μέσον) is the earth, and its place (ὁ τοῦ μέσου τόπος) is the centre of the universe. Perhaps, however, the phrase means simply 'in the region about the centre' (i. e. of the universe): cf. 35a 25.

34b 32–34. γῇ . . . τόπῳ. The compounds must all contain earth because there is more earth than anything else in the region where they exist, that being Earth's 'proper place'.

34b 34—35a 3. ὕδωρ . . . διαπίπτοι ἄν. What defines the shape of the compound is Fire (cf. * 35a 14–21): but Water is essential to every compound, if it is to possess a definite shape, for two reasons. For (i) Water, of all the four 'elements', is most characteristically ὑγρόν (cf. * 31a 3–6), and τὸ ὑγρόν is *par excellence* readily adaptable in shape: and (ii) Water, *qua* ὑγρόν, gives cohesion to the Earth in the compound. Cf. * 29b 24–26, * 29b 30–32.

35a 3–9. γῇ . . . ἐνέσται. Every compound must contain Earth and Water, as we have seen. But Earth (cold–dry) and Water (cold–moist) are contrary respectively to Air (hot–moist) and Fire (hot–dry), so far as one οὐσία can be contrary to another (cf. * 31a 1–3). Now (cf. e. g. * 29b 10–11) the constituents, out of which a compound comes-to-be, must be contrary to one another. Hence the compound, since it contains cold–dry, must also contain the contrasted extremes 'hot–moist' (Air): and since it contains cold–moist, it must also contain the contrasted extremes 'hot–dry' (Fire).

35a 9–14. μαρτυρεῖν . . . ἄρδειν. We can infer the constituents of the ὁμοιομερές from the constituents of its food, because the food, in so far as it *is* food (i. e. actually nourishes) must have been 'assimilated': cf. * 20b 34—21a 29, * 21b 35—22a 4. Now the food of all living things consists of moist and dry (cf. e. g. *de Part. Anim.* 650a 3–4). It must therefore contain at least two of the 'simple bodies': for moist and dry cannot be coupled together to constitute a single 'element' (cf. 30a 31–33). And in fact all living things—plants as well as animals—require in their food Earth (cold–dry) and Water (cold–moist): cf. e. g. *de Gen. Anim.* 762b 12–13. Hence the ὁμοιομερῆ in plants and animals are said to consist of Water and Earth (*Meteor.* 384b 30–31: cf. above, * 31a 3–6).

Even plants (Aristotle here points out, 35a 11–14) do not live

by Water alone, as careless observers might suppose. They are nourished *naturally* by Water impregnated with Earth and *artificially* by Water mixed with manure, which is a kind of Earth.

In ^{a} 14 E reads κόπρα over ἄρδειν. This is no doubt a mere note, but it gives the right sense. Philoponos says the γεωργοί mix with the Water τὴν κοπρώδη (sc. γῆν) ἥτις καὶ πυρώδους καὶ ἀερώδους μετέχει οὐσίας: but Aristotle is not here concerned with Fire and Air.

35^{a} 14–21. ἐπεὶ . . . ὅροις. The meaning of this obscure passage seems to be as follows:—

(a) The food, i.e. the dry and the moist, is *par excellence* the ὕλη of the ὁμοιομερές. It is the inner heat (the hot-cold or tempered-hot) which, by digesting the food, converts it into the substance of the ὁμοιομερές, or 'forms' it (cf. * 29^{b} 24–26).

(b) What 'is fed', and what 'grows', is (cf. * 21^{b} 17—22^{a} 33, * 21^{b} 24–25, * 21^{b} 25–28) the 'form' or 'figure' taken along with the matter. Now this 'form' or 'figure' is constituted by the Fire in the make-up of the ὁμοιομερές. Fire alone of the four 'simple bodies'—or most of them all—is of the nature of 'form'. For the 'form' of anything lies in its continent limits or outline. And (i) Fire by nature moves towards the outermost sphere of the Lower Cosmos, thus circumscribing Air, Water, and Earth, as their containing outline (cf. * 22^{b} 2–3): and (ii) within each ὁμοιομερές, Fire may be said to constitute its outline. For Fire's movement towards 'the limit' will take it to the limit of the ὁμοιομερές.

35^{a} 16. ἡ μορφή. In A. 5 (21^{b} 27–28) σχῆμα is used instead of μορφή.

35^{a} 17–18. τρέφεσθαι . . . λέγουσιν. Cf. *de Vita et Morte* 469^{b} 21 ff., *Meteor.* 354^{b} 33 ff.; Theophrastos, fr. iii. 1, § 4 (Wimmer, iii, p. 51); Gilbert, pp. 443$_{1}$, 445$_{1}$.

B. 9–10

35^{a} 24—37^{a} 33. Ἐπεὶ . . . χρόνον. In these chapters Aristotle (i) treats of the four causes of the γενητὰ καὶ φθαρτά, thus fulfilling his original plan (cf. 14^{a} 1–6), and (ii) adds a note (37^{a} 17–33) in confirmation of his theory of the efficient cause.

The account here given of the material cause (35^{a} 32 – ^{b} 5) is a restatement in somewhat modified terms of the doctrine implied in A. 3. As regards the formal cause Aristotle briefly repeats the doctrine assumed in his criticism of Empedokles (cf. * 33^{b}

16–20). He defines it as the 'formula expressing the essential nature', and thus identifies it with the final cause, i. e. the normal (perfect) development of the type of thing in question (35ᵇ 6–7). Nothing more is said of these three causes. But it is incidentally shown (36ᵇ 26–34) that the continuity of coming-to-be contributes to the perfection of the scheme of things—an indication of the line which a teleological explanation of γένεσις would *ultimately* take for Aristotle. The rest of the treatise on the causes is devoted to the efficient cause. Aristotle shows (i) that a complete explanation of γένεσις is impossible without the recognition of its efficient cause (35ᵇ 7—36ª 12); (ii) what the efficient cause of γένεσις and φθορά is (36ª 14 – ᵇ 10); and (iii) how his theory accords with observed facts and explains a well-known problem (36ᵇ 10—37ª 15).

35ª 24–28. Ἐπεὶ . . . πρῶτον. We have now established that there are γενητὰ καὶ φθαρτά—that γένεσις ἁπλῆ and φθορά actually occur—in the region about the centre (cf. * 34ᵇ 31–32), i. e. in the Lower Cosmos. It remains for us to determine the *number* and the *nature* of the 'originative sources of all coming-to-be alike', i. e. of γένεσις considered as the universal of which the γενέσεις of the various types of γενητά are specific forms (ª 26 πάσης γενέσεως ὁμοίως: cf. * 14ª 2, * 18ª 25–27). This is the right procedure: for it is a principle of method that 'a grasp of the true theory of any universal facilitates the understanding of its specific forms' (ª 27–28. οὕτω is merely the antecedent of ὅταν . . . πρῶτον. The reading of FHJ, τὰ καθ' ἕκαστα, is supported by Philoponos, p. 281, ll. 9–10).

35ª 24. γενητά. According to the manuscripts Aristotle uses both γεννητός and γενητός (cf. Bonitz, *Ind.* 150ª 37 ff. and 155ᵇ 12 ff.), though I confess to a suspicion that we ought always to read γεννητός, even where γενητός is better attested. Above (27ᵇ 8) I read γεννητοῦ with EHL: but throughout the present passage I have retained the form with one *ν*, which is given by EFJ and sometimes also by H. The evidence for ἀγένητος (cf. 37ª 20) and γεννητικός (cf. 36ª 18) is overwhelming: cf. Bonitz, *Ind.* 5ᵇ 41 and 149ª 37.

35ª 28–29. εἰσὶν . . . πρώτοις. Though the bodies of the Upper Cosmos—the 'celestial bodies'—are eternal, they are perceptible and in movement. Hence they too require material, formal, efficient, and final causes: i. e. ἀρχαί the same in number, and *generically* the same, as the ἀρχαί of the γενητὰ καὶ

φθαρτά. For *τὰ πρῶτα* (i. q. *τὰ οὐράνια σώματα*) cf. e. g. *de Caelo* 288^{b} 18–19. As contrasted with the *γενητὰ καὶ φθαρτά*, they are sheerly actual substances, primary 'reals', the sources of the life and change in the sublunary sphere: cf. e. g. Introd. §§ 3, 10, * 36^{a} 14–18.

35^{a} 31–32. οὐ . . . πρώτοις. The 'celestial bodies' require an efficient cause *for their movement*, though not *πρὸς τὸ γεννῆσαι*, since they are *ἀγένητα καὶ ἄφθαρτα* (cf. * 28^{b} 32–33).

35^{a} 32 – ^{b} 5. ὡς . . . μὴ εἶναι. The celestial bodies (a) *qua* perceptible, involve matter as well as 'form'; but their matter is the Aether and is itself eternal: and (b) *qua* moving, they involve *ὕλη πόθεν ποῖ* (*ὕλη τοπική*), i. e. a something *δυνατόν*, viz. a *ὑποκείμενον* capable of occupying successively the different points on its orbit (cf. Introd. § 10).

But the bodies of the Lower Cosmos, inasmuch as they are continuously undergoing *γένεσις* and *φθορά*, involve a matter which is the subject of this dual process (35^{b} 2–3 *τὸ γενητὸν-καὶ-φθαρτόν*). Their matter is something *δυνάμει ὄν*, i. e. a something which at one time exists, but at another time does not exist. We may therefore define it as *τὸ δυνατὸν εἶναι καὶ μὴ εἶναι* (35^{a} 33, ^{b} 4–5). It is something which *per se* is not actual, though capable of being actualized, i. e. formed. When it is formed, a *σύνθετος οὐσία* has 'come-to-be', and *exists*. And when that substance 'passes-away', the matter has been transformed, i. e. has passed from one of its actualizations to another.

The antecedent of *ὅπερ* (^{b} 2) is *τὸ δυνατὸν εἶναι καὶ μὴ εἶναι* (^{a} 33), the intervening sentences forming a parenthesis. In ^{a} 35 *τούτων* includes (i) 'the things which *are* of necessity' and (ii) 'the things which of necessity *are not*'. The antecedent of *τοῦτο* (^{b} 3) is *τὸ γενητὸν-καὶ-φθαρτόν*.

35^{b} 6–7. ὡς . . . οὐσίας: cf. * 33^{b} 16–20.

35^{b} 7—36^{a} 12. δεῖ . . . ὄργανα. In order to establish the need for an investigation of the efficient cause, Aristotle divides all preceding theories into (i) those which (like the theory of 'Sokrates in the *Phaedo*') tried to explain *γένεσις* and *φθορά* by the formal cause, i. e. as effects of the 'forms': and (ii) those which (like the theories of the Atomists, the Pythagoreans, and Empedokles) tried to explain *γένεσις* and *φθορά* by the material cause, i. e. as effects of the movement originating in the matter. The inadequacy of both types of theory is to be ascribed, Aristotle urges, to the absence of a clear recognition of the efficient cause.

35ᵇ 9. οἱ μέν. There does not seem to be any evidence to determine to what theories (if to any), besides that of 'Sokrates in the *Phaedo*', Aristotle is here referring.

35ᵇ 11. ἐπιτιμήσας . . . εἰρηκόσιν: cf. *Phaedo* 96 a–99 c.

35ᵇ 12–15. ὑποτίθεται . . . ἀποβολήν: a rough paraphrase of *Phaedo* 100 b–101 c.

35ᵇ 15–16. ὥστ' . . . φθορᾶς. Aristotle is still paraphrasing the *Phaedo*. Sokrates (cf. 99 e–100 b, 101 d–e) thinks that 'provided his *ὑποθέσεις* are sound' (ᵇ 15 *ταῦτα*, sc. the doctrines which Aristotle has just summarized from the *Phaedo*) it 'necessarily follows that the Forms are causes of *γένεσις* and *φθορά*'.

35ᵇ 16–17. οἱ δ' . . . κίνησιν. Philoponos (p. 282, ll. 3 and 4; p. 286, ll. 19, 28, and 29) interprets the 'movement' here in question as the *τροπή* in the matter, by which he appears to mean the 'turning' of the atoms in the theory of Leukippos and Demokritos (cf. * 15ᵇ 33—16ª 2; * 16ª 1–2). But there is no reason to suppose that Aristotle is thinking exclusively of the Atomists. His description is wide enough to include e. g. Empedokles (cf. * 15ª 22) and possibly Archelaos (cf. *Phaedo* 96 b, with Burnet's note *ad loc.*). Moreover, part of Aristotle's criticism (cf. * 36ª 1–12) is directed against a doctrine which we have good reason to attribute to the Pythagoreans (cf. * 18ᵇ 6–7, * 30ᵇ 13–19).

35ᵇ 18–24. εἰ . . . πραττομένων: criticism of the theory of 'Sokrates in the *Phaedo*'. (i) The Forms and the Participants always *are*—e. g. there always is a body which can come-to-be healthy, and there always is Health—but *γένεσις* is intermittent; and (ii) at any rate in the products of *τέχνη* (ᵇ 23 *δύναμιν*, i. q. *τέχνην*: cf. Burnet, *Ethics*, Introd. § 12) we actually see a cause other than the Forms at work. For patients or pupils do not come-to-be healthy or learned without the action of the doctor or the teaching of the man of science.

35ᵇ 24—36ª 12. εἰ . . . ὄργανα. Aristotle's criticism of the theories, which tried to explain *γένεσις* by the material cause, is based upon his own doctrine (cf. also * 35ᵇ 34–35). As the reader will remember, *αὔξησις* requires (a) an efficient cause, viz. the *αὐξητικὴ ψυχή* or *τὸ ἐνὸν αὐξητικόν*, which (b) employs *τὸ θερμόν* as an auxiliary active force for the digestion and assimilation of the food, in order that (c) the living thing may grow to its normal stature, i. e. to its *μορφή* or *εἶδος* which is its 'end' (cf. * 20ª 8, * 20ᵇ 34—21ª 29, * 22ª 10–13). Similarly *γένεσις* requires

(a) an efficient cause, viz. the 'basal' soul, the soul *qua* γεννητική, which (b) employs certain secondary or auxiliary forces, in order that (c) τὸ γεννώμενον may come-to-be. The auxiliary forces here in question are certain δυνάμεις inherent in, and constitutive of, the matter—i. e. the elementary qualities, and specially the 'active' couple, viz. the hot and the cold (cf. * 29^{b} 24–26).

Aristotle begins (35^{b} 24–29) by praising the materialists. Their theory is more scientific (φυσικώτερον) than that of Sokrates, for at least they recognize that *movement* is required to account for γένεσις. But (^{b} 29–31) they were wrong in supposing that this movement originates in the matter. Matter is passive: it is a δύναμις only in a passive sense. What initiates movement is a δύναμις in a different sense, an active force. This objection is confirmed (^{b} 31–33) by an appeal to the facts. Neither in natural γένεσις, nor in artificial production, does the matter of itself make the result. Hence they are wrong (^{b} 33–35) not only in ascribing the movement to the matter, but also in omitting the 'more controlling cause', viz. the 'form'. Moreover (36^{a} 1–12), by eliminating the formal cause, they deprive themselves of the right to regard the 'material forces' (e. g. the hot and the cold) as causes of γένεσις *in any sense*, even as 'instrumental' or auxiliary forces.

35^{b} 26–29. τὸ γὰρ . . . κινητικόν. 'For what "alters" and transfigures plays a greater part' (sc. than the Forms) 'in bringing things into being; and we are everywhere accustomed, in the products of nature and of art alike, to look upon that which can initiate movement as the producing cause.'

Cf. * 21^{b} 6–10, * 24^{a} 24 – ^{b} 22, * 24^{b} 13–18. τοῦτο (^{b} 27) is the antecedent of ὃ ἂν ᾖ κινητικόν. Failure to recognize this perhaps gave rise to the erroneous variant (^{b} 28) ἀπὸ τέχνης, ἀπὸ τέχνης δέ . . . .

35^{b} 29–31. τῆς . . . δυνάμεως. We speak of 'matter' (a) in so far as there is a δύναμις τοῦ πάσχειν, or (b) in so far as there is a δύναμις in contrast to an ἐνέργεια—a mere 'potentiality', or something 'potentially existent', in contrast to something realized and actual. But matter is not an ἀρχὴ μεταβολῆς ἐν ἄλλῳ—not a δύναμις in the sense of an active or operative force. Cf. e. g. *Metaph.* 1046^{a} 9–29, 1048^{a} 25 – ^{b} 9.

35^{b} 34–35. καὶ . . . μορφήν. According to Aristotle's own doctrine, *the form* (not *the matter*, as the materialists supposed, cf. 35^{b} 17) initiates and controls the processes, by which a work

of τέχνη is made or a living thing in Nature brought into being. The architect, e. g., conceives the 'form' which the completed house is to exhibit—its structural plan, the scheme of synthesis which is to be realized in the materials (the bricks and beams). It is this 'form'—the 'form' as 'in the soul' of the architect, or as the τέχνη οἰκοδομική (cf. * 20^{b} 18–21)—which initiates and controls the processes of building. Similarly in the γένεσις of a living thing—e. g. of an animal or a child—the 'form' is the 'controlling' cause. For the 'form', implanted by the efficient cause (i. e. by the generating parent) in the matter, initiates therein a determinate movement or change (κίνησις), which in turn causes other succeeding changes until the matter has been developed into the offspring which is to come to birth (cf. *de Gen. Anim.* 733^{b} 23 ff., with Professor Platt's notes in his translation; *Metaph.* 1033^{b} 29—1034^{a} 8, 1034^{a} 33 – ^{b} 4, &c.).

Formal, final, and efficient causes, it will be observed, come very close together in Aristotle's explanation of ποίησις and γένεσις. For the 'form' of the house is the ideal to be realized and the originative source of the processes which the architect (the so-called 'efficient cause') sets going. And the male parent is the efficient cause only *qua* communicating the 'form' (i. e. the soul, cf. * 20^{a} 8, * 21^{b} 16–17) to the embryonic matter: whilst the final cause of the γένεσις is the completed embodiment of that 'form', i. e. the new representative of the species. As we shall see (cf. * 36^{a} 14–18), the *ultimate* formal, final, and efficient causes are one and the same, viz. God.

36^{a} 1–12. ἔτι . . . ὄργανα. The special form of the materialist theory, which Aristotle here criticizes, is ascribed to Parmenides by Diels (p. 110): and Philoponos says that Alexander attributed it to 'the followers of Parmenides'. It appears in fact to be the doctrine—only more fully stated—which Aristotle elsewhere ascribes to 'Parmenides', i. e. to the Pythagoreans criticized in the 'Way of Opinion': cf. * 18^{b} 6–7, * 29^{b} 27, * 30^{b} 13–19.

The Pythagorean materialists regard γένεσις and φθορά as the effects of certain forces—e. g. the hot and the cold—inherent in, and constitutive of, the matter of which bodies consist. It is the nature of each of these 'elementary qualities' or 'material forces' to act or to suffer action in certain definite ways. Hence the hot and the cold, and the like, are *both* the materials out of which (or into which), *and* the forces by means of which, all the other things come-to-be (or pass-away).

Now, according to Aristotle's own doctrine (cf. * $35^{b}24$—$36^{a}12$), the hot and the cold are forces inherent in, and constitutive of, the matter of *φυσικὰ σώματα*: and they are employed by the efficient cause as instrumental to its purpose of bringing *τὸ γεννώμενον* into being. Hence (a) they are not genuine efficient causes of *γένεσις* and *φθορά*, but only secondary causes. The hot, e. g., does not originate the *κίνησις* which results in the coming-to-be of a new individual of the species: but it acts as a mediating link, communicating to the matter the *κίνησις* originated by *τὸ γεννητικόν*. For the hot can be itself moved in a certain way and, being thus moved, it can set something else moving in the same way. And (b) they become *instrumental* to *γένεσις*, only so far as they are 'used' by the efficient cause in the service of the final cause.

The Pythagorean materialists, therefore, are open to the following criticisms:—(i) Since they abstract the formal cause, the hot and the cold can no longer be regarded as 'instrumental'. They assign too high a rank to such material forces in speaking of them as the 'instruments' of *γένεσις* and *φθορά* (cf. $36^{a}6$ *διὰ τούτων . . . φθείρεσθαι*); for—apart from the formal (i. e. the efficient and the final) cause—they are not *ὀργανικαί*. (ii) They forget that these material forces are passive as well as active. Thus even Fire (the hot *par excellence*, cf. * $30^{b}25$–30) obviously 'is moved', i. e. suffers action. Hence these material forces cannot *originate* *κίνησις*: for *τὸ πρῶτον κινοῦν* is *ἀκίνητον*, and *τὸ πρῶτον ποιοῦν* is *ἀπαθές* (cf. $24^{b}12$–13). (iii) The part, which these material forces in fact play in *γένεσις*, is that of 'instruments' or 'tools' of the final (efficient and formal) cause. It is therefore as absurd to regard them as the causes of *γένεσις* as it would be to view the saw and plane as the causes of the things made by the carpenter. Finally (iv) even if we admit that (e. g.) Fire—unlike the carpenter's tools—does act or set things moving *of itself*, the movement, which it thus 'originates', is not instrumental to *γένεσις*: on the contrary, it is destructive. Fire therefore, if we consider it apart from the controlling cause, is actually less conducive to *γένεσις*, than are the tools to *ποίησις*.

$36^{a}2$. **λίαν ὀργανικάς**, i. e. they make the material forces *too instrumental* in character. They treat mere natural forces as auxiliary to a purpose, though they have eliminated all notion of a formal cause, and therefore also all notion of a final cause.

36ª 12. ἀλλὰ . . . ὄργανα. This criticism is somewhat obscure owing to its brevity: I have followed Philoponos in my interpretation (cf. * 36ª 1–12).

36ª 13–14. ἡμῖν . . . μορφῆς. Aristotle's 'general account of the causes' is given in the *Physics* (B. 3–9), and his special account of the material and formal causes of *γένεσις* and *φθορά* is contained in the present chapter (35ª 32 – ᵇ 7).

36ª 14 – ᵇ 10. ἔτι . . . φύσιν. Aristotle's theory of the efficient cause of *γένεσις* and *φθορά* presupposes his astronomical system, which is based upon the system of Eudoxos as modified by Kallippos. The reader should consult *Metaph.* 1073ᵇ 18—1074ª 17, and the excellent exposition in Heath, pp. 190 ff., from which I make the following extracts. 'Eudoxus adopted the view which prevailed from the earliest times to the time of Kepler, that circular motion was sufficient to account for the movements of all the heavenly bodies. With Eudoxus this circular motion took the form of the revolution of different spheres, each of which moves about a diameter as axis. All the spheres were concentric, the common centre being the centre of the earth; hence the name of "homocentric spheres" used in later times to describe the system. The spheres were of different sizes, one inside the other. Each planet was fixed at a point in the equator of the sphere which carried it, the sphere revolving at uniform speed about the diameter joining the corresponding poles; that is, the planet revolved uniformly in a great circle of the sphere perpendicular to the axis of rotation. But one such circular motion was not enough; in order to explain the changes in the speed of the planets' motion, their stations and retrogradations, as well as their deviations in latitude, Eudoxus had to assume a number of such circular motions working on each planet and producing by their combination that single apparently irregular motion which can be deduced from mere observation. He accordingly held that the poles of the sphere which carries the planet are not fixed, but themselves move on a greater sphere concentric with the carrying sphere and moving about two different poles with a speed of its own. As even this was not sufficient to explain the phenomena, Eudoxus placed the poles of the second sphere on a third, which again was concentric with and larger than the first and second and moved about separate poles of its own, and with a speed peculiar to itself. For the planets yet a fourth sphere was required similarly related to the

three others; for the sun and moon he found that, by a suitable choice of the positions of the poles and of speeds of rotation, he could make three spheres suffice. . . . The spheres which move each planet Eudoxus made quite separate from those which move the others. One sphere sufficed of course to produce the daily rotation of the heavens. Thus, with three spheres for the sun, three for the moon, four for each of the planets, and one for the daily rotation, there were 27 spheres in all. . . . It would appear that he did not give his spheres any substance or mechanical connexion; the whole system was a purely geometrical hypothesis, or a set of theoretical constructions calculated to represent the apparent paths of the planets and enable them to be computed.' Kallippos (cf. Arist. *Metaph.* 1073^{b} 32–38) 'thought it necessary to add two more spheres . . . to the sun and moon respectively, if one wishes to account for the phenomena, and one more to each of the other planets'. Aristotle (cf. *Metaph.* 1073^{b} 38—1074^{a} 14) 'transformed the purely abstract and geometrical theory into a mechanical system of spheres, i. e. spherical shells, in actual contact with one another; this made it almost necessary, instead of assuming separate sets of spheres, one set for each planet, to make all the sets part of one continuous system of spheres. For this purpose yet other spheres had to be added which Aristotle calls "unrolling" or "back-rolling" (*ἀνελίττουσαι*), by which is meant "reacting" in the sense of counteracting the motion of certain of Eudoxus's and Callippus's spheres which, for the sake of distinction, we may with Schiaparelli call "deferent"'. Hence (Heath, p. 219), according to Aristotle, nine spheres (five 'deferent' and four 'back-rolling') combine their revolutions to produce the apparent motion of the sun.

In the present passage Aristotle begins by recalling two theses which he had established in the *Physics* (36^{a} 15 *δέδεικται*, ^{a} 18–19 *τὸ πρότερον καλῶς εἴρηται*: the reference is to *Phys.* Θ. 7–9), viz. that motion (a) is eternal and (b) is the primary form of change, of which all other forms, including *γένεσις*, are derivatives. Motion, therefore, causes coming-to-be (36^{a} 25), and the *eternity* of motion causes the *continuity* of coming-to-be (36^{a} 15–18). But we have still to determine *precisely what motion* is the efficient cause of *γένεσις* and *φθορά*. Since *γένεσις* and *φθορά* (i) occur continuously or uninterruptedly in the Lower Cosmos and (ii) are contrary to one another; the motion, which is their efficient cause, must be (i) eternal and continuous, and (ii) in

some sense *dual* or internally diverse, since it has to cause a pair of contrary effects (36ª 23–31).

These two conditions, Aristotle maintains, are satisfied by ' the motion along the inclined circle ' (36ª 32), i. e. by the sun's annual movement in the ecliptic or zodiac circle. For that movement is continuous (cf. * 36ᵇ 2–3) : and it brings τὸ γεννητικόν, i. e. the sun, alternately nearer to, and further away from, any given point on the earth's surface (cf. * 36ᵇ 3–6).

The alternation of γένεσις and φθορά is ascribed to the sun's movement in the zodiac circle in *Meteor.* 346ᵇ 16 ff. (cf. * 36ᵇ 6–7) : and the doctrine is implied e. g. in *Metaph.* 1071ª 15–16, 1072ª 10–18, *Phys.* 194ᵇ 13.

36ª 14–18. ἔτι . . . γεννητικόν. Aristotle is only beginning the statement of his doctrine, and his language is not quite precise. The *continuity* of γένεσις is due to the eternity of motion. But the whole effect to be explained is the *continuous alternation* of γένεσις and φθορά. Possibly Aristotle uses the plural (ª 16 τούτων ὄντων) because he is thinking not only of the eternity of motion (ª 15–16), but also of the ' inclination of the circle ' which he will specify (36ᵇ 3–10) as the cause of the sun's alternate approach and retreat.

There is a similar want of precision in 36ª 16–18 (ἢ . . . γεννητικόν), which is not remedied by F's omission of καὶ ἀπάγειν (ª 18). But we have no right to expect pedantic accuracy in the first rough statement of a theory.

Aristotle's doctrine of the efficient cause of γένεσις and φθορά has a certain ' metaphysical ' or ' theological ' background, which it will be convenient to sketch briefly here. Eternal circular motion, which the *Physics* (Θ. 7 and 8) had shown to be possible, is actually exhibited *in the first instance* by the revolution of the πρῶτος οὐρανός, i. e. the outermost of the concentric spheres, the sphere in which are set the fixed stars. Its revolution is eternal and uniform because it is the πρῶτον κινούμενον, i. e. because it is *immediately* moved by the πρῶτον κινοῦν which is ἀΐδιον as well as ἀκίνητον, i. e. by God (cf. e. g. *Phys.* 258ᵇ 12—260ª 10). But the motion, which the outermost sphere derives immediately from God, is imparted to the whole system of concentric spheres, since they are in contact one with another. Hence, through the mediation of the πρῶτον κινούμενον, the ' revolution of the whole heavens ' (cf. 36ᵇ 3 ἡ τοῦ ὅλου φορά) is eternal too.

Now God is conceived by Aristotle as absolute ' form ' or sheer

actuality, and as therefore also the ultimate final cause and the ultimate (or primary) efficient cause. For (i) God, as sheer actuality, is the fulfilment in which all effort must recognize its end—i. e. God is 'the Best', the supreme object of all desire. And Aristotle represents all things in the Cosmos as inspired by love of God, as striving, so far as in them lies, to attain to God; i. e. to imitate in their activities that perfect and eternal life, that self-dependent and self-fulfilling spiritual activity, which is God. But (ii) God, as sheer actuality, is the underived origin of all motion, i. e. the primary efficient cause. The eternal life, which is God, radiates through the whole system. It communicates itself immediately (as we have seen) to the *πρῶτον κινούμενον* in the form of eternal uniform revolution. In the subordinate spheres (in the lower regions of the heavens) the movements, though still continuous and eternal, are no longer uniform, since they are transmitted through more than one intermediary—i. e. the movements of the planets are irregular, since they are the resultants of many revolutions. And in 'the region about the centre'—i. e. in the sublunary sphere—there is no revolution at all. The divine life is manifested here, in this region furthest removed from the *πρῶτον κινοῦν*, in the enfeebled and imperfect processes of the perishable things, viz. in the movements and transformations of the four 'simple' bodies, in the movements of the animals and men, in *γένεσις* and *φθορά*, in *ἀλλοίωσις*, and in *αὔξησις* and *φθίσις*. (Cf. Introd. §§ 3 and 4, * 36^{b} 26–34, * 36^{b} 30–32; Philoponos, p. 288, ll. 24–26; *Metaph.* 1072^{a} 19—1073^{a} 13, *Phys.* 250^{b} 11–15, *de Caelo* 279^{a} 16–30, 288^{a} 13–17, 292^{a} 18–^{b} 25.)

36^{a} 18. τὸ γεννητικόν. All movement is the movement of a body. The outermost sphere, e. g., is a spherical shell, i. e. a spherical *body*, whose substance is the Aether (cf. Introd. § 10): and it is this 'body' which revolves uniformly and eternally. Similarly the movement along the ecliptic, which is the efficient cause of *γένεσις* and *φθορά*, is the movement of a body, viz. of the sun (cf. 36^{b} 1 *ἀεὶ μέν τι κινεῖσθαι*, ^{b} 7 *ταὐτὸν τοῦτο*, ^{b} 17 *τοῦ ἡλίου*). Aristotle calls the sun 'the generator': but, strictly speaking, it is the alternately approaching and receding sun which causes, alternately, *γένεσις* and *φθορά*. The sun, *qua* near, *γεννᾷ*: and the sun, *qua* remote, *φθείρει* (cf. * 36^{b} 6–7, * 36^{b} 8–10).

36^{a} 19–20. τὸ . . . εἰπεῖν. This clause is in apposition to, and epexegetic of, *τὸ πρότερον* (^{a} 18). The thesis is established in *Phys.* 260^{a} 26—261^{a} 26.

36ª 23–25. ἐπεὶ . . . φθορά: cf. above, 17ᵇ 33 ff.

36ª 26–31. φανερὸν . . . τἀναντία. The grammatical construction has become slightly deflected: but *in effect* Aristotle is saying 'It is clear that, in order to account for the occurrence of both γένεσις and φθορά, not *one motion only* (ª 26–29 μιᾶς . . . φθορά), but *more motions than one* are required (ª 29–31 δεῖ . . . τἀναντία)'. At first sight Aristotle's words (δεῖ δὲ πλείους εἶναι τὰς κινήσεις) suggest that *separate* contrasted movements are required: but he makes it clear immediately (36ª 32 – ᵇ 2) that the two contrasted movements are constituents of the single 'motion along the inclined circle'.

36ª 30. ἐναντίας . . . ἀνωμαλίᾳ: 'contrasted with one another either by the *sense* of their motion or by its irregularity.'

(i) One movement is 'contrary' to another, only if the terminal points of the former are spatially contrary to those of the latter. If e. g. A is *above* and B *below*, or A *right* and B *left*, or A *front* and B *back*, then a movement from A to B is contrary to a movement from B to A. The two movements, from A to B and from B to A, are then ἐναντίαι φοραί or ἐναντίαι τῇ φορᾷ. From this it follows that there is no movement contrary to circular motion. If a body is carried round in a circle, from whatever point in the circumference its motion starts, it must equally, in each revolution, reach all the contrasted positions in its circle: and its movement round its circle, whatever its *sense*, is (if we consider each complete revolution) 'from the same to the same', and not from contrary to contrary terminus. (Cf. *de Caelo* 270ᵇ 3²—271ª 33.)

From this conception of 'contrariety of motion' it follows that if the movements, which cause γένεσις and φθορά, are ἐναντίαι τῇ φορᾷ they cannot be (either or both of them) complete revolutions. And in fact (see preceding note) they are contrasted portions of the sun's completed circle along the ecliptic.

(ii) Every form of process—'alteration', growth and diminution, motion—may be uniform (ὁμαλής) or irregular (ἀνώμαλος): and the term ἀνώμαλος is applied below to the matter of the γενητὰ καὶ φθαρτά (in so far as its temperament and texture are not everywhere the same) and also to certain γενέσεις and φθοραί (cf. * 36ᵇ 20–24). It appears, however, that the terms, when applied to *motion*, express the contrast between a motion with unchanging, and a motion with changing, velocity. The characteristic of an *irregular* motion is that its velocity increases towards, and diminishes from, a maximum. Hence it contains

a plurality of different, and possibly contrary, part-motions: and is 'one' only by 'continuity', i. e. only because the end of one of its part-motions is the beginning of another. In a *uniform* motion, on the other hand, there is the same velocity throughout. It is absolutely 'one'; for all its constituent motions are similar, i. e. any one of them could be substituted for any other. Hence a body which moves uniformly and the path of its motion must themselves be uniform—i. e. must be such that any part could coincide with (could be substituted for) any other. From this it follows that the path of a uniform motion must be *either* a straight line *or* a circle. But a straight line (since Aristotle does not admit an Infinite) contains an ἀρχή and a τέλος. Bodies, therefore, which move along a straight line, cannot move uniformly. For, if their motion is 'natural', its velocity will increase as they get further from the point of rest (the ἀρχή) towards the τέλος of their path: whilst if their motion is παρὰ φύσιν, its velocity will diminish as they get further from the ἀρχή of their path, since that means further from the force which impelled them to move 'against their nature'. A circle alone contains in itself neither ἀρχή nor τέλος nor μέσον: i. e. a circular path has no natural terminus.

Hence revolution—the revolution of a body which is itself uniform, viz. of a sphere—is the only motion which is absolutely 'uniform'. (Cf. e. g. *de Caelo* 288ª 13–27; *Phys.* 228ᵇ 15—229ª 6, 265ᵇ 11–16.)

36ª 34 – ᵇ 1. ἀνάγκη . . . φθορά. συνεχής is probably to be taken as predicate: cf. 36ᵇ 25.

36ᵇ 1. τι: cf. * 36ª 18.

36ᵇ 2. δύο, sc. κινήσεις κινεῖσθαι, cf. 36ª 33.

36ᵇ 2–3. τῆς . . . αἰτία. The 'first motion' (cf. 36ª 31 ἡ πρώτη φορά) is that of the πρῶτος οὐρανός, which revolves once in every twenty-four hours from East to West. Since it carries round with it the whole system of concentric spheres, Aristotle here speaks of it as ἡ τοῦ ὅλου (sc. οὐρανοῦ) φορά: cf. * 36ª 14 – ᵇ 10, * 36ª 14–18; *Phys.* 267ᵇ 8–9. It is absolutely single and uniform, for what is revolving is a sphere (cf. * 36ª 30): and its velocity is greater than that of the proper revolution of any of the other celestial spheres. Owing to its singleness, uniformity, and supreme velocity, the astronomers use it as the unit or standard of all the celestial motions: cf. *de Caelo* 287ª 23–26, *Metaph.* 1053ª 8–12.

Philoponos quotes this interpretation of ἡ τοῦ ὅλου φορά from Alexander, but perversely rejects it.

36ᵇ 3–6. τοῦ δὲ . . . κίνησις. Aristotle, with a natural economy of his full astronomical theory (cf. * 36ª 14 – ᵇ 10), speaks as if *two spheres* only were required to produce the sun's movements, viz. (i) the sphere of the fixed stars, and (ii) a sphere moving 'about an axis perpendicular to the plane of the zodiac' (Heath, p. 198: cf. also *de Caelo* 285ᵇ 28, where Aristotle refers to 'the second revolution, viz. that of the planets'). The sun is carried in its annual movement by this second sphere along the ecliptic or zodiac circle: and the latter is inclined at an angle to the equator of the first sphere, which is the equator of the universe and is in the same plane as the terrestrial equator. Owing to this inclination, the sun, at different points of its annual path, 'will cross the celestial equator, be north of it, cross it again and be south of it' (cf. N. Lockyer, *Elementary Lessons in Astronomy*, § 363). Hence the sun in its annual movement will alternately 'approach' and 'recede from' any given point on the earth's surface (e. g. Athens). Aristotle adds (36ᵇ 5–6) 'since the sun's distance' (viz. from any given point on the earth's surface) 'is thus unequal, its movement will be irregular'. This ought to mean (cf. * 36ª 30) that the sun's annual movement will alternately accelerate towards, and diminish from, a maximum velocity; and perhaps Aristotle is referring to the apparent arrest of the sun's motion at the solstices. For the sun appears to stand still at its extreme north and south declinations, i. e. at those points on the λοξὸς κύκλος which are furthest removed from the equator of the outermost sphere. After each solstice the direction of the sun's movement is changed and it moves 'back' towards the points of intersection of the ecliptic and equator, which it reaches at the vernal and autumnal equinoxes. If the sun's movement is ἀνώμαλος in the strict sense of that term, we must suppose that it accelerates from ἠρεμία at each solstice till it reaches its ἀκμή at the next equinox; and diminishes in velocity from each equinox till it reaches ἠρεμία at the next solstice.

36ᵇ 6–7. ὥστ' . . . φθείρει. The sun's annual movement includes, as we have seen, part-motions which are contrary to one another in 'sense' and perhaps also contrasted in velocity. The whole movement, therefore, is the efficient cause of the alternation of γένεσις and φθορά, one part-motion causing γένεσις and the other φθορά. Aristotle maintains that certain 'facts of observation' (36ᵇ 15–19) confirm his view that γένεσις is the effect of the sun's *approach* and φθορά of its *retreat*. What are these 'facts'?

Aristotle is thinking (i) of the growth of vegetation, &c., in spring and summer, and its decay in autumn and winter: (ii) of the birth and death of those insects (e. g.) which do not survive the winter: (iii) of the development and decay of the other animals and plants (cf. * 36^{b} 8–10): and (iv) probably also of the annual cycle of the seasons, i. e. the annual alternation of drought and heat with cold and rain. For the increased heat, produced by the sun's annual 'approach', vaporizes and draws up the Water on and near the earth, so that it is converted into Air: whilst, when the sun 'retreats', the original heat in the vaporized Water is partly 'quenched' by the cold of its environment, and partly 'dissipated' by rising into still higher regions, so that the Air condenses into cloud, and descends again to earth in the form of Water. This seasonal cycle—Water streaming up as *ἀτμίς* and becoming Air, Air condensed into cloud and streaming down as rain—is the result, Aristotle thinks, of an 'imitation' of the sun's circular movement in the ecliptic. (Cf. *Meteor.* 346^{b} 16—347^{a} 12, and Alexander's commentary *ad loc.* Cf. also above, * 22^{b} 2–3, * 30^{b} 4, * 31^{a} 24.)

The reader will have observed an obvious difficulty, which is noticed by Alexander and Philoponos. For (cf. * 18^{a} 23–25) the *γένεσις* of one thing is *eo ipso* the *φθορά* of something else and *vice versa*. How, then, can the sun's *approach* be the cause of *γένεσις only* and its *retreat* be the cause of *φθορά only*? If the plant or the animal comes-to-be, the seed passes-away: and when the former pass-away, there is a *γένεσις* of certain simple (or relatively-simple) constituents. So, in the seasonal cycle, the *γένεσις* of Air is the *φθορά* of Water, the *φθορά* of Air the *γένεσις* of Water.

The solution of this difficulty depends, we must suppose, upon a difference of rank, or degree of reality, in the *γενητά* (cf. * 18^{b} 14–18; Philoponos, p. 289, ll. 27 ff.; Alexander, *ἀπορίαι καὶ λύσεις*, iii. 4). The plant and the animal are 'more real' than the seed: Air is 'more real' than Water, for it is nearer to the *ἀρχή*, i. e. the *πρῶτον κινοῦν*. Hence the 'approach' of the sun brings into being the 'more real' *γενητά*: and the *φθορά* of the 'less real' things, which this *γένεσις* involves, is only a subordinate concomitant effect of the sun's action. Similarly the 'retreat' of the sun destroys the 'more real' things, and this *φθορά* is only incidentally accompanied by the *γένεσις* of things 'less real'.

36^{b} 8–10. *καὶ εἰ . . . φύσιν.* Aristotle endeavours to bring within the scope of his theory the ripening to maturity and the

decay to extinction of the longer-lived organisms. He supposes that the sun 'generates' such organisms—i. e. brings them to their *ἀκμή* or full development—by a succession of its 'approaches', and causes their *φθορά* by a succession of its 'retreats'. And he enunciates it as a general law that the period of their natural development to their *ἀκμή* is equal in length to the period of their natural decay towards their *φθορά*. It is obvious, as Philoponos observes, that the phenomena here in question are *αὔξησις* and *φθίσις* rather than *γένεσις* and *φθορά* in the proper sense: and the substitution of *φθίσις* for *φθορά* (336b 18) is perhaps significant as an indication of what was in Aristotle's mind.

Aristotle does not explain why, if a succession of the sun's 'approaches' (e. g. twenty successive summers) causes the full development of an oak or a man, the successive 'retreats' during the same period (i. e. the corresponding winters) do not counteract this effect: nor conversely, why the successive summers, during the period of the organism's decline, do not neutralize the destructive power of the winters. We must suppose that he would have met this difficulty by his theory of the *σύμφυτον θερμόν*, though there is no evidence to show the precise form which his answer would have taken. The development of a living thing, as we know from other works, is due to the co-operation of (a) the heat in the environment (i. e. in the Air or Water in which the thing lives), which is derived principally from the sun, and (b) the 'connate vital heat', which is contained in the heart of sanguineous animals and in the analogous organ of bloodless animals. This 'vital heat' (*σύμφυτος θερμότης φυσική, θερμότης ψυχική, ζωτικὴ θερμότης, φυσικὸν θερμόν*, κτλ.) plays a very important part in Aristotle's physiological and biological theories: cf. e. g. * 29b 24–26; *de Gen. Anim.* 736b 33 ff., 762a 18–21, 784a 34 ff.; *Parva Naturalia* 469b 6 ff., 473a 9–12; *Meteor.* 379a 3 ff.

336b 10–15. *διὸ . . . μέτρον.* The Order controlling all things in the Cosmos assigns a determinate period of life to each species of living thing. Within this period, so many years, e. g., are required for the process of development to maturity and an equal number of years for the decline to extinction. The individual members of the species conform, *as a general rule*, to their specific period. And the period of each species is distinctive, i. e. the various species are distinguished from one another (b 12 *διορίζονται*) by the various numbers which express the differing lengths of their periods. There are constant references in Aristotle's works to

the Order controlling the system of things: cf. Bonitz, *Ind.* 747^{a} 30 ff. It is referred to below, 37^{a} 15 (*τεταγμένη*).

In 36^{b} 15 the grammatical subject is *ἡ περίοδος*, with which *τὸ μέτρον* is in apposition.

36^{b} 20–24. *ἀλλὰ . . . φθοράν.* The vital period of the species, assigned by the Order, demands equal duration for the process of development and for the process of decline: but to this, as to every general rule, there are exceptions. It often happens that individuals of a given species die prematurely:—i. e. that their decline occupies a shorter time than their development, or a shorter time than the Order prescribes (b 20 *ἐν ἐλάττονι φθείρεσθαι*: either interpretation is possible, and both come to the same thing). This, like all exceptions to the general rules in nature, is due to the matter. For the matter, of which the living things are composed, is 'irregular', i. e. not the same in texture throughout (cf. * 36^{a} 30). Hence the *γενέσεις* of some individuals in a species will be 'irregular', i. e. will exhibit a velocity varying from the normal or specific rate; so that some of them will develop too quickly and others too slowly. Now, since the *γένεσις* of one thing is *eo ipso* the *φθορά* of another, each abnormally rapid *γένεσις* will *eo ipso* involve an abnormally rapid *φθορά*. Premature death, therefore, or abnormally rapid decline in *some* individuals is only the inevitable obverse of premature or abnormally rapid development on the part of *other* living things, whether of the same or of a different species.

This interpretation, by which alone a tolerable meaning can be extracted from the passage, involves the placing of a comma after *συμβαίνει* and the insertion of *τό* after *διά* in b 24. *συμβαίνει*, sc. *πολλάκις ἐν ἐλάττονι φθείρεσθαι* (cf. b 20). In the same line *τούτων* refers to the things whose *γένεσις* is *ἀνώμαλος*, i. e. *in this case* 'too rapid'.

36^{b} 20–21. †*διὰ . . . σύγκρασιν*†. All the manuscripts read *σύγκρασιν*. Philoponos quotes *σύγκρουσιν* as a variant. Neither word, so far as I can discover, occurs elsewhere in Aristotle, though both are to be found once in the spurious *de Plantis*.

It is difficult to extract a satisfactory meaning from these words whether we read *σύγκρασιν* or *σύγκρουσιν*. Pacius, who reads *σύγκρασιν*, interprets 'ob mutuam invicem conspirationem'. By this he appears to mean 'because of the way in which the *γενητὰ καὶ φθαρτά* are implicated with one another', i. e. (cf. b 21–24) because every *γένεσις* is intertwined with a *φθορά* and

vice versa. But (a) *σύγκρασις* is a very inappropriate word, and (b) the phrase would then only anticipate *obscurely* what the following lines state *clearly*.

Philoponos wishes to interpret *τὴν πρὸς ἄλληλα σύγκρασιν* as 'the reciprocal attemperament of the *στοιχεῖα*'. This would give an excellent sense, since the matter of living things is a blend or attemperament of the four elementary qualities. But there is nothing in the context to justify us in supposing that the things which are 'reciprocally attempered' are the *στοιχεῖα*.

If we read *σύγκρουσιν*, we might suppose Aristotle to mean that premature death is due to 'collision'—i. e. to life being crushed out *βίᾳ*, instead of vanishing by the process of natural decline. But this interpretation is impossible, since it would leave the next sentence (*ἀνωμάλου γὰρ . . . φθοράν*) disconnected and pointless. Philoponos himself suggests two very unconvincing interpretations of *σύγκρουσιν*, viz. (i) 'the reciprocal consilience of the causes, i. e. the material cause and the proximate and primary efficient causes'; but—not to mention other objections—there is nothing in the context to suggest that the *σύγκρουσις* is a *σύγκρουσις τῶν αἰτίων*: and (ii) 'the *συνδρομὴ τῶν σχημάτων* of the sun, the other planets, and the stars' (i. e. their 'conjunction' in an astrological sense), to which he ascribes a certain influence in determining the span of life. Here again it is a sufficient objection that nothing in the context justifies us in identifying *ἄλληλα* with *τὰ οὐράνια* or with their *σχήματα*.

On the whole I have thought it best to obelize the words as probably spurious.

36b 25–26. *ἀεὶ . . . αἰτίαν*. Aristotle has explained (i) how the material cause renders it possible for *γένεσις* and *φθορά* to occur continuously, without ever failing in nature (b 26 *ἣν εἴπομεν αἰτίαν*, sc. the material cause, cf. 18a 9–10, * 18a 23–25), and (ii) how the sun's annual movement in the ecliptic acts as the efficient cause of the continuous alternation of these processes.

36b 26–34. *τοῦτο . . . γένεσιν*. Aristotle briefly indicates the final cause of the continuity of *γένεσις*, i. e. shows how it contributes to fulfil the perfection of the universe. The continuity of *γένεσις* is a logical consequence of the fundamental teleological principle for the explanation of natural phenomena, viz. that 'Nature in all things always strives after the better'.

Since 'being' is better than 'not-being', every thing, if nature's purpose could be fully attained, would always 'be', i. e. would be

individually eternal. But the eternity of the individual is impossible in the Lower Cosmos: for the things in that sphere are too remote from the ἀρχή (i. e. from God) to share in the 'eternal life', except in a very feeble degree and in a very imperfect form (cf. * 36ª 14–18). They are σύνθετα, and their matter (unlike that of the stars and planets) is τὸ δυνατὸν-εἶναι-καὶ-μὴ-εἶναι (cf. * 35ª 32 – ᵇ 5). It is in constant process of transformation: hence *individually* they cannot 'be' except for a limited time, and in a sense which presupposes 'not-being' and necessarily involves a future φθορά or cessation of 'being'. But nature secures 'eternity' for them in another sense. For although each *individual* comes-to-be and passes-away, each *species* always 'is' owing to the continuity of γένεσις—i. e. each species is always actual, embodied in an unbroken succession of individual representatives. Hence every individual thing in the Lower Cosmos shares in eternity in virtue of its 'form'. For its 'form' is the species, the specific character of all the individual embodiments; and this neither comes-to-be nor passes-away, but exists for ever—i.e. there is no gap between, and no end to, its 'recurrences' in its representatives.

Thus the continuity of γένεσις contributes to the perfection of the universe. For by it, and by it alone, the sublunary sphere is linked up with the celestial spheres, since even the γενητὰ καὶ φθαρτά, in virtue of this continuity, contribute to, and share in, the divine life which is 'the best' or the τέλος of the whole system.

Aristotle touches below (cf. * 38ᵇ 6–19) on the distinction between the *individual* eternity of e. g. the stars and planets and the *specific* eternity of the γενητὰ καὶ φθαρτά, and explains it by the difference in their matter.

The reader may be reminded in this connexion that Aristotle, as well as Plato, regarded the impulse of the individual living thing to 'propagate its kind' as the expression of its striving after eternity. The perishable things attain to immortality and eternal life, so far as in them lies, in the perpetuation of their species (cf. e. g. Plato, *Symp.* 207 d ff.; Arist. *de Anima* 415ª 25 – ᵇ 7).

36ᵇ 29. τὸ . . . εἴρηται. The different meanings of εἶναι and τὸ ὄν are constantly set forth in Aristotle's works, and specially in the *Metaph.* (cf. e. g. 1017ª 7 ff., 1026ª 33 ff., 1028ª 10 ff., 1045ᵇ 32 ff., 1051ª 34 ff.: and above, Introd. § 3). It is 'being' in the primary and superlative sense—the substance which is pure 'form' or sheer actuality—that Aristotle here seems to have in

mind. But the principle that 'being is better than not-being' no doubt involves also the superiority of τὸ ὂν ὡς ἀληθές to τὸ μὴ ὂν ὡς ψεῦδος, and again of the adjectival 'reals' to τὰ μὴ ὄντα, and even of the 'potentially-real' to that which is ἁπλῶς μὴ ὄν.

36b 30–32. τοῦτο . . . γένεσιν. All things in the universe are animated by desire or love for 'the best', i. e. for God; and God is eternal life (cf. * 36a 14–18). But the divine life is reflected in the actions and activities of the derivative things with decreasing intensity and diminishing adequacy in proportion to their increasing distance from God. Thus even the heavenly bodies, though they are free from γένεσις and φθορά and though they are individually eternal, only approximate in their activities to the divine actuality. Their life *is* not 'the good'. They live in 'actions' or 'series of actions' (πράξεις) by which they approximate to 'the good' more or less closely, and by less or more indirect paths (cf. *de Caelo* 292a 18 – b 25). The things of the Lower Cosmos, as we have seen (* 36b 26–34), are incapable of individual eternity. They cannot 'be', but only 'come-to-be'. Yet, by the continuity of their coming-to-be, they share in the eternity of their species.

In view of Chapter 11, it is important to notice that the uninterrupted linear succession of individuals, which embodies the eternity of a species, is in fact an unbroken repetition of cycles. As Philoponos expresses it, the perishable things attain to specific eternity only 'by imitating the circular movement of the heavenly bodies'. Thus, in order that the human species may be eternally actual, the cycle 'man–seed–embryo–child–youth–man' must be endlessly repeated.

36b 32–34. οὕτω . . . γένεσιν. συνείρειν was used intransitively above, 16a 8, 18a 13. Here it is passive. We must understand τὸ εἶναι (b 33) in its widest sense, so as to include the 'being' of all forms and kinds of ὄντα. In b 34 τὴν γένεσιν is, I think, the subject of the verb γίνεσθαι, the words τὸ γ. ἀ. κ. τ. γένεσιν forming a single phrase—'that coming-to-be should itself (καὶ) come-to-be perpetually'.

36b 34. τούτου, sc. τοῦ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν.

37a 1. ἡ . . . συνεχής. The same thing (cf. *Phys.* 261a 31 ff.) cannot come-to-be and pass-away, increase and diminish in magnitude, alter from hot to cold and *vice versa*, or move from A to B and back again, *without a break in its change* at the point where reversal takes place. In that sense, no μεταβολή except

circular motion is 'continuous' (for the meaning of *συνεχής*, cf. * 16^{b} 4).

The 'continuity' of *γένεσις* and *φθορά* in nature, upon which Aristotle insists, is not the continuity of a single *μεταβολή*, i. e. not continuity in the change of a single thing. What he maintains is that (a) there always are things coming-to-be in nature and *eo ipso* there always are things passing-away: (b) everything which comes-to-be is thereby committed to a 'vital cycle' which it is bound to complete by passing-away: (c) the endless linear succession of the individuals of a species is the endless repetition of a cycle (cf. * 36^{b} 30–32): and (d) the course of nature *as a whole* is a cycle, in which the dominance of *γένεσις* as the sun approaches alternates with the dominance of *φθορά* as it retreats.

37^{a} 1–7. **διὸ . . . ἐστιν.** The reciprocal transformations of Earth, Air, Fire, and Water are due to the conversion of one, or both, of their constitutive elementary qualities into the contrary quality or qualities (cf. B. 4). Of these elementary qualities, the dry and the moist are *par excellence* passive (*πάθη*) and the hot and the cold are *par excellence* active (*δυνάμεις*): cf. * 29^{b} 24–26. Hence 'the things which are reciprocally transformed in virtue of their passions and their powers of action' are *in the first instance* the 'simple bodies', which Aristotle here adduces in illustration; though the description is no doubt intended to cover the *σύνθετα* also, in so far as their *γενέσεις* and *φθοραί* are ultimately due to the transformations of the *ἁπλᾶ σώματα* of which they all consist (cf. * 28^{b} 32–33; 34^{b} 31 ff.).

Now there are in nature reciprocal transformations of the 'simple bodies' which go on endlessly and continuously. One instance is the transformation of Water into Air and Air into Water, to which we owe the succession of the seasons (cf. * 36^{b} 6–7). But Aristotle's words here (37^{a} 4–6 and ^{a} 7–15) suggest that he is thinking of a still more comprehensive cycle of transformations, in which Fire is included as well as Water and Air. (Perhaps, indeed, the reciprocal transformation of Water and Air is to be regarded as simply a part of the more comprehensive cycle.) And in fact there is, as we saw (* 22^{b} 2–3), a never-ending cycle of transformations of the Water, Air, and Fire, which envelop the Earth. Water is always ascending and becoming Air, Air always ascending and becoming Fire: and conversely, Fire is always descending and becoming Air, and Air descending and becoming Water.

In all such transformations there is motion in a straight line, upwards and downwards: but since the motion is reversed—the terminus of the ascent becoming the *ἀρχή* of a complementary descent and *vice versa*—it 'returns upon itself', and thus 'imitates circular motion' and is continuous. The upward and downward motions together form a cycle of transformations which inevitably repeats itself endlessly.

37ª 5. *πάλιν . . . ὕδωρ.* Aristotle abbreviates his description of the downward transformation, omitting the intermediate stage, viz. Air.

37ª 7. *ἡ . . . ἐστιν.* The principle is of universal application, though it is here inferred from the *εὐθεῖα φορά* upwards and downwards of Water, Air, and Fire. Hence L's reading (*εὐθεῖα τούτων φορά*) must be rejected as a blundering correction.

37ª 7–15. *ἅμα . . . τεταγμένῃ.* The sun's annual movement, by which it alternately approaches and retreats, causes the alternate ascent and descent of Water, Air, and Fire. They are thus brought into contact, Water with Air, Air with Fire, Fire with Air, and Air with Water: and the effect of this contact is the action–passion, and the reaction and re-passion, of the contrary constitutive elementary qualities, from which the transformations of these 'simple bodies' result (cf. e.g. * 23ª 12–22, * 34ᵇ 20–30).

Apart from this continuous reciprocal transformation of the 'simple bodies', which is thus due to the 'dual motion', the Lower Cosmos would long ago have suffered disruption. For each of the 'simple bodies' would long ago, in the infinite lapse of time, have reached its 'proper place'—the place allotted to it by the Order (ª 15 *τεταγμένῃ*, cf. * 36ᵇ 10–15)—and have remained there quiescent and isolated. Hence, if it were not for the sun's 'dual motion', all interaction between the 'simple bodies', all chemical process, all formation and dissolution of compounds—in short, all energy and life whatever—would have vanished from nature.

37ª 8. *τινες.* It is not known who these people were.

37ª 9. *ἐν . . . χρόνῳ.* The physical universe 'contains and comprehends within itself infinite time' (*de Caelo* 283ᵇ 29: and cf. below, * 37ª 22–25). Hence whatever is true of the 'simple bodies' as they exist in the Lower Cosmos *now*, must be compatible with their having existed through an infinite antecedent time.

37ª 10. οὐ . . . σώματα. The problem is to explain why the *simple* bodies have not long ago got entirely separated from one another. Hence, though such an isolation of the simple bodies would entail also the disruption of the *compound* bodies, we must reject J's *τὰ σύνθετα σώματα* as a correction due to misunderstanding.

37ª 15–17. διότι . . . εἰρημένων. This little epilogue marks the completion of the treatise on the causes: cf. * 35ª 24—37ª 33.

διότι, i. q. *ὅτι*: cf. * 33ᵇ 22–26.

37ª 17–33. ἐπεὶ . . . χρόνον: a note to confirm Aristotle's theory that the revolution of the outermost sphere is the efficient cause of the *continuity* of the sun's annual movement, and therefore (mediately) of the *continuity* of the alternation of *γένεσις* and *φθορά*.

The note takes the form of (i) a gigantic *protasis* (37ª 17–31), breathless indeed and rather loose in syntax, but concentrating into a number of distinct *praemissa* the results of Aristotle's discussions in *Phys.* Θ, so far as they are relevant to his present purpose: and (ii) an *apodosis* (37ª 32–33) which (a) reaffirms in a more precise form the thesis asserted at 36ᵇ 2–3 (*τῆς μὲν οὖν συνεχείας ἡ τοῦ ὅλου φορὰ αἰτία*), leaving us to infer that the revolution of the 'body' which constitutes the outermost sphere is *mediately* the cause of the continuity of the alternation of *γένεσις* and *φθορά*, and (b) answers a question, which was suggested by one of the *praemissa* (37ª 22–25), but is not otherwise connected with the present inquiry.

The *praemissa* may be summarized thus:—

(i) If there is to be continuous eternal movement, there must be a single, unmoved, ungenerated, and unalterable initiating cause (ª 17–22): (ii) there must be continuous circular movement because of the continuity of time (ª 22–25): (iii) the continuity of the movement depends upon the continuity of the body which is moved (and not *primarily* upon the continuity of the 'path' of its movement); but the continuous moving body must move in a circle if it is always to remain continuous with itself throughout its movement (ª 25–31).

37ª 17–22. ἐπεὶ . . . ἀρχήν. Cf. *Phys.* Θ. 255ᵇ 31—260ª 10: *Metaph.* 1072ª 19—1074ᵇ 14. The reference here and below (cf. ª 18 *πρότερον*, ª 25 *ἐν τοῖς ἐν ἀρχῇ λόγοις*) is to the *Physics*, the first in the series of Aristotle's works on natural philosophy: cf. Introd. § 10.

37ª 22–25. συνεχοῦς . . . διωρίσθη. On Aristotle's conception of time, cf. *Phys.* 217ᵇ 29—224ª 17, 251ᵇ 10 ff.; *Metaph.* 1071ᵇ 6–11.

Time and change reciprocally imply one another. There can be no change which is not in time, no time without change, and no perception of time without the perception of change.

'Continuity' and 'succession' are *primarily* spatial and characterize magnitudes (cf. * 16ᵇ 4). But the change of a continuous magnitude, so far as the latter preserves its continuity, is itself 'continuous': and exhibits 'succession' ('before' and 'after') in a sense analogous to the 'succession' (order of position) in the parts of the magnitude. From this continuity and succession in change, the continuity of time and its order of 'before' and 'after' are derived.

We recognize time when we perceive 'before' and 'after' in a change: i. e. when we perceive a change *now*, and again *now*, and recognize that the 'nows' are two and separated from one another by an interval different from both. Time, in fact, is that which is limited by the 'now': and that which is limited is change *qua* numerable or measurable. Hence time may be defined as ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον: but by ἀριθμός in this definition we must understand τὸ ἀριθμούμενον or τὸ ἀριθμητόν, and not ᾧ ἀριθμοῦμεν (cf. *Phys.* 219ᵇ 1–8).

Time is one, continuous, uniform in its flow, and without beginning or end. Ultimately, therefore, the change of which it is a πάθος—i. e. of which it is the ἀριθμός or the μέτρον in the sense explained—must itself be one, continuous, uniform, and without beginning or end. But the only kind of change, which *can* satisfy these conditions, is circular motion: and the only change, which *in fact* satisfies them, is the revolution of the outermost sphere (cf. * 36ª 30). Time therefore implies, and is implied by, the eternal uniform revolution of the πρῶτος οὐρανός. It is *that* in it which is 'numerable' or 'counted'. It 'measures' it, and is 'measured' by it.

37ª 23. χωρίς. FHJ read ἄνευ, which E recognizes as a variant. But it is difficult to see why ἄνευ should have been corrected into χωρίς, whereas χωρίς may have been altered into ἄνευ owing to the scribe's reminiscence of *Phys.* 218ᵇ 33 and 219ª 1.

37ª 25–31. συνεχὴς . . . ἀεὶ συνεχές. Continuity is predicable *primarily* of magnitude (cf. * 37ª 22–25): and μέγεθος, in its fullest and most proper sense, is three-dimensional, i. e. σῶμα (cf.

e. g. *de Caelo* 268ª 20–24). Hence the continuity of a movement is determined *primarily* by the continuity of the moving body. But 'amongst continuous bodies which are moved, only that which is moved in a circle is "continuous" in such a way that it preserves its continuity with itself throughout the movement' (ª 30–31 τούτου . . . ἀεὶ συνεχές). Hence 'that in which the movement occurs'—i. e. the *path* of the movement—contributes, by its continuity, to the continuity of the movement.

37ª 26–27. πότερον . . . πάθος; Aristotle is here concerned only with φορά. But the general doctrine, which he is applying, was based in the *Physics* on discussions covering all forms of μεταβολή. Hence he illustrates the 'sphere' (τὸ ἐν ᾧ) of κίνησις by πάθος (which is the 'sphere' of ἀλλοίωσις: cf. e. g. *Phys.* 262ª 2–5) as well as by τόπος.

In ª 26 τὸ ἐν ᾧ = τῷ τὸ ἐν ᾧ, by an ellipse not uncommon in Aristotle. Cf. Bywater, *Contributions to the textual criticism of the Nic. Ethics*, note on 1132ᵇ 1. Similarly in ª 29 τῷ ἐν ᾧ = τῷ τὸ ἐν ᾧ (sc. συνεχὲς εἶναι).

37ª 28–30. πῶς . . . ἔχει. The result of this parenthesis—viz. that the continuity of the 'sphere' of φορά (though not of any other kind of κίνησις) contributes, as a secondary condition, to the continuity of the movement—is utilized in the continuation of the main sentence. For it is only a *circular* 'path' which is continuous: hence continuous movement implies a continuous body moving in a circle.

37ª 30–31. τούτου . . . ἀεὶ συνεχές. τούτου (sc. τοῦ κινουμένου ᾗ συνεχοῦς) is a partitive genitive. For a similar instance of the partitive genitive in the singular, cf. *Eth. Nic.* 1127ª 7 and Bywater, l. c., note on 1149ª 16.

τὸ κύκλῳ, sc. κινούμενον: cf. e. g. *de Caelo* 270ª 33 (τὸ κύκλῳ σῶμα), 289ª 30 (τοῦ κυκλικοῦ σώματος). Philoponos wrongly supposes the phrase to mean τὸ κυκλοτερὲς σῶμα. When Aristotle refers to the *shape* of the revolving body (i. e. of the οὐρανός), he speaks of it as σφαιροειδές: cf. e. g. *de Caelo* 286ᵇ 10—287ᵇ 21.

37ª 33. ἢ . . . χρόνον, sc. συνεχῆ ποιεῖ.

B. 11

37ª 34—38ᵇ 19. Ἐπεὶ . . . εἶναι. With the treatise on the causes Aristotle has completed the task which he originally proposed to himself (cf. * 35ª 24—37ª 33). The present chapter, therefore, is to be regarded as an appendix. The bulk of the

chapter (37ª 34—38ᵇ 6) explains in what sense, and under what conditions, the things which come-to-be are 'necessary'. Aristotle establishes that any continuous coming-to-be, *which is cyclical*, exhibits 'absolute' as well as 'hypothetical' necessity. The remainder of the chapter (38ᵇ 6–19) briefly explains why γένεσις in some instances is cyclical, whilst in other instances it proceeds (or *appears to proceed*) in a straight line onwards without reversion.

There is a good exposition of 37ᵇ 14—38ᵇ 19 in Alexander, ἀπορίαι καὶ λύσεις, iii. 5.

37ª 34 – ᵇ 3. Ἐπεὶ . . . γενέσθαι : formulation of the main problem of the chapter. Wherever there is continuous change of any kind, there must be consecutiveness. For a *continuum* (τὸ συνεχές) is that kind of consecutive series (τὸ ἐφεξῆς), whose terms are (a) immediately next to one another (ἐχόμενα) and moreover (b) so closely connected that their limits are not merely ἅμα, but coalesce into one : cf. * 16ᵇ 4. Hence the continuity of γένεσις implies a succession of γιγνόμενα such that γιγνόμενον follows 'consecutively', and without any interval, upon γιγνόμενον. The problem then arises :—Is the coming-to-be of every member of this succession *contingent*, so that every one of them might fail to come-to-be? Or is the coming-to-be of any of them *necessary* in the sense that some member (or members) *will be* of necessity?

37ᵇ 3–9. ὅτι . . . ἔσται. The question is whether *any* of the γιγνόμενα *will be* of necessity. For that the coming-to-be of *some of them at any rate* is 'contingent', is evident (a) from the different meaning assigned by common usage to the terms μέλλει and ἔσται (ᵇ 3–7 : cf. also *Parva Naturalia* 463ᵇ 28–31) and (b) from the fact that the *being* of some things is contingent, which implies a corresponding contingency in their *coming-to-be* (ᵇ 7–9).

The argument in ᵇ 3–7 is an appeal to linguistic usage; and therefore I prefer to alter μέλλον into μέλλει with Φᶜ, instead of adopting Bywater's neat emendation (τὸ ὃ ἔσται) of the reading in the manuscripts (τὸ ἔσται).

37ᵇ 7–9. ὅλως . . . ἔσται. Aristotle is appealing to a general distinction (ὅλως) within τὰ ὄντα, which is a fundamental principle of his philosophy. The omission of τά (ᵇ 9) makes the argument slightly more cogent. οὕτως ἕξει, sc. ἐνδέχεται καὶ μὴ γενέσθαι. τοῦτ', sc. τὸ γίνεσθαι.

37ᵇ 12–13. οἷον . . . ἐνδέχεσθαι; The problem is :—Are *all* γιγνόμενα contingent (i. e. *at most* conditionally or hypothetically necessary), or are some—e. g. the occurrence of the solstices—

unconditionally or absolutely necessary? If the solstices are absolutely necessary occurrences, they correspond to the necessary ὄντα which are ἀδύνατα μὴ εἶναι (^{b} 11–12): they will therefore be ἀδύνατα μὴ γενέσθαι, i. e. it will be impossible for them to be μὴ δυνατὰ γενέσθαι or μὴ ἐνδεχόμενα γενέσθαι. They cannot 'fail to be able to occur': for, if so, their occurrence might not even be *actual*, and *a fortiori* it would not be necessary.

This interpretation of ^{b} 13 (οὐχ οἷόν τε μὴ ἐνδέχεσθαι, sc. τροπὰς γενέσθαι) is consistent with the doctrine of *de Interpr.*, chapters 12 and 13. It is false, we must remember (l. c. 22^{b} 29–33), to say of 'the necessary' that it is μὴ δυνατὸν εἶναι, as well as to say of it that it is δυνατὸν μὴ εἶναι.

Bonitz, perhaps rightly, places a mark of interrogation after γένεσιν (^{b} 12), and reads ἆρα for ἄρα in ^{b} 13.

37^{b} 14–25. εἰ δὴ . . . ὕστερον. Aristotle lays down the general principles of the *nexus* between antecedent and consequent in a temporal sequence: cf. *Post. Anal.* 95^{a} 24—96^{a} 7.

If, in a temporal sequence, A is the cause of an effect B, B's occurrence implies the prior occurrence of A. Hence from the being of B we can infer that A must have occurred: and unless A occurs, B will not occur. But we cannot, from the occurrence of A, infer that B will occur. The *nexus*, therefore, so far is not reciprocal. B is not necessary at all, and A is only ἐξ ὑποθέσεως ἀναγκαῖον—i. e. necessary, if B is to occur, or presupposed in the being of B.

Suppose, however, that B's occurrence is unconditionally or absolutely necessary, whilst, *whenever* B occurs, its being will presuppose the occurrence of A. Under these conditions, the *nexus* is in a sense reciprocal. For (as before) B's occurrence implies the prior occurrence of A. And, if A occurs, B will occur—because B in any case must occur and, when it occurs, its occurrence will follow upon the prior occurrence of A. Here, therefore, the absolute necessity of B extends itself, as it were, over A, since A's occurrence is presupposed in that of B.

The validity of the latter part of this argument clearly depends upon the meaning which Aristotle gives to 'absolute necessity of occurrence'; and that is explained below, 37^{b} 29—38^{a} 5. The effect of that explanation is to restrict 'absolute necessity of occurrence', and the reciprocal necessary *nexus*, to the members of eternally-repeated cycles of γιγνόμενα. Moreover, even in such cycles (cf. * 38^{b} 6–19), 'absolute necessity of occur-

rence' attaches to the members of the cycle only *qua* embodying an identical type or species, not to them *qua* individuals severally excluding one another.

$37^b 25$—$38^a 17$. εἰ . . . κύκλῳ. No member of a rectilinear succession of γιγνόμενα, whether infinite ($^b 25$–29) or finite ($^b 29$–33), can exhibit 'absolute necessity of occurrence'. If a thing is to come-to-be with 'absolute necessity', it must come-to-be always and invariably: and that is possible only if it is a member of an eternally-repeated cycle of γιγνόμενα ($37^b 33$—$38^a 5$). Hence 'absolute necessity of occurrence' and 'reciprocal necessary *nexus*' (which depends upon it) are to be found only in cyclical κίνησις and cyclical γένεσις ($38^a 5$–17).

$37^b 25$–29. εἰ . . . γενέσθαι. The reading of E^1J in $^b 26$, which I have adopted (except that I have substituted τοδὶ for τόδε), is given as a variant by Alexander (ἀπορίαι καὶ λύσεις, ii. 22, pp. 71, 72) whose interpretation I have followed.

In a causal succession of events, proceeding from the present onwards in a straight line *ad infinitum* ($^b 25$ εἰς ἄπειρον . . . ἐπὶ τὸ κάτω), there can be no member whose occurrence is absolutely necessary. For take any one of the events subsequent to the present, e. g. P ($^b 26$ τῶν ὕστερον τοδί). P's future occurrence is necessarily *presupposed* by (i. e. is contingent upon) the future occurrence of the still later next event, R; *that* is contingent upon the future occurrence of the still later next event, S; and so on *ad infinitum* ($^b 27$–28 ἀεὶ . . . γενέσθαι). Hence the occurrence of P, and of every subsequent member of the infinite succession, is *contingent* (ἐξ ὑποθέσεως ἀναγκαῖον) and not *absolutely necessary* (ἁπλῶς ἀναγκαῖον).

If P's occurrence were absolutely necessary, P would be an originative source (an ἀρχή) of the whole succession and would invest all the preceding events with absolute necessity (cf. * $37^b 14$–25). But the succession is *ex hypothesi* ἄπειρον, and there can be no ἀρχή in what is ἄπειρον.

The ἀρχή, which Aristotle denies to this succession proceeding *ad infinitum* in the future (cf. $^b 28$–29), is in fact, as Alexander rightly insists, a τέλος.

It would be the genuine 'first' or 'primary determinant' of the temporally-preceding events, as the 'end' in which they culminate, or the final cause to which they are the necessary means.

$37^b 29$—$38^a 3$. ἀλλὰ . . . ἀνάγκης. Even in a *finite* rectilinear

causal succession, we cannot attribute absolute necessity to the occurrence of the last member; and therefore none of the members is absolutely necessary, but all are contingent (cf. * 37^{b} 14–25). Thus, e. g., in the building of a house, the succession begins with the preparation of the clay or the shaping of the stones, proceeds through the laying of the foundations, and terminates in the coming-to-be of the house (37^{b} 31–33; cf. ^{b} 14–18 and *Post. Anal.* 95^{b} 32–37). But the coming-to-be of the house is not ἁπλῶς ἀναγκαῖον. For, if it were, it would have to be ἀεί. What *is* ἐξ ἀνάγκης ἁπλῶς, cannot possibly *not-be*: i. e. its *being* is eternal. Similarly, if the γένεσις of anything is ἐξ ἀνάγκης ἁπλῶς, the γένεσις cannot possibly fail: i. e. the γένεσις is eternal, or the thing is ἀεὶ τῇ γενέσει (37^{b} 33—38^{a} 3: cf. e. g. *Eth. Nic.* 1139^{b} 23–24, *de Part. Anim.* 639^{b} 21—640^{a} 9). But it would be absurd to contend that 'house' is ἀεὶ τῇ γενέσει. When the foundations have been laid, the succession may nevertheless remain uncompleted, since on any given occasion a house ἐνδέχεται μὴ γίνεσθαι (37^{b} 32–33. ὅταν γὰρ γένηται, sc. θεμέλιος. τοῦτο, sc. τὴν οἰκίαν).

In ^{b} 33 I have retained τό, although it rests only upon LΦ^{c}, because the argument gains in clearness and force by its retention.

38^{a} 5–17. ἀνάγκη . . . κύκλῳ. The argument is in substance clear, though the text seems to have got disturbed at ^{a} 10.

Coming-to-be must either go on *ad infinitum*, or come to a stop, i. e. be *finite*. If finite, it cannot be eternal. Since, therefore, it is to be eternal (as was shown in B. 10), it must go on *ad infinitum*. If so, there are two alternatives. It must either (i) proceed *ad infinitum* in a straight line or (ii) return upon itself in a circle, i. e. form endlessly-repeated cycles. Now *the first* of these alternatives (^{a} 6 τούτων refers to the immediately preceding words, viz. καὶ εἰ μή, ἢ εἰς εὐθὺ ἢ κύκλῳ) is impossible. For (cf. * 37^{b} 25–29) in an infinite rectilinear succession of γιγνόμενα there can be no ἀρχή, and therefore no absolute necessity, and therefore (cf. preceding note) no eternity.

Hence *the second* alternative alone remains.

38^{a} 8. λαμβανομένων. The genitive depends on ἀρχήν. 'There can be no ἀρχή of the members of an infinite rectilinear succession, whether they be taken "downwards", i. e. as if they were future events, or "upwards", i. e. as if they were past events.'

38^{a} 9–10. ἀνάγκη . . . εἶναι. The meaning appears to be:—

'Yet coming-to-be must have an originative source if it is to be necessary and therefore eternal, nor can it be eternal if it is limited.' But the text at ^{a} 10 is hopelessly corrupt. It seems probable that the corrupt words †*μήτε πεπερασμένης οὔσης*† conceal *μήτ' ἐπὶ πέρας ἐχούσης* (cf. E), or *μήτ' ἐπὶ πεπερασμένης εὐθείας* (cf. Φ^c, p. 312, l. 1): but a clause must have dropped out between *ἀρχήν* and *μήτε*.

38^a 10–17. **διὸ . . . κύκλῳ.** The only remaining alternative (* 38^a 5–17) is that the *γένεσις* should be cyclical.

In a cyclical succession with e. g. four members (we can take any number we like, for the principle is not affected: cf. ^{a} 13–14 *οὐδὲν . . . πολλῶν*) we shall have A necessarily succeeded by B, B by C, C by D, and D by A: and, conversely, D necessarily presupposing C, C necessarily presupposing B, B A, and A D. Whichever way we look at this cyclical succession, it must repeat itself endlessly and continuously (^{a} 13 *καὶ . . . συνεχῶς*). If e. g. the earth be moistened, vapour must rise: if vapour rises, cloud must form: if cloud forms, rain must fall: and if rain falls, the earth must be moistened, and the cycle has recommenced. And, conversely, if rain falls, cloud must have formed: if cloud has formed, vapour must have risen: if so, the earth must have been moistened: if so, rain must have fallen:—and so on continuously and *ad infinitum* (cf. *Post. Anal.* 96^a 2–7).

38^a 17 – ^{b} 5. **ταῦτα . . . ὑπὸ τούτων.** The conclusion just established (*ταῦτα*, cf. ^{a} 14–17) is logically concordant with the eternity of the revolution of the *οὐρανός* which Aristotle had proved on other grounds in *Phys.* Θ. 7–9. For since that is circular and eternal, it is also necessary: and the movements which are parts of it (e. g. the movements of the inner concentric spheres), or dependent upon it, will be necessary, eternal, and circular also. Thus the outermost sphere, which is eternally being moved in a circle, eternally sets the inner spheres moving in circles (^{b} 1–3 *εἰ . . . κίνησιν*). Hence the sun is eternally moved in a circle in a determinate manner (^{b} 3 *κύκλῳ ᾗδί*, sc. in the ecliptic) and this solar motion causes the eternal cyclical change of the seasons. Finally, on the latter depend the eternally-repeated cyclical vital periods of the living things on and about the earth: cf. * 36^a 14–18, * 36^b 6–7, * ^{b} 8–10, * ^{b} 10–15.

In ^{b} 3 I read *κύκλῳ* after *ἥλιος* with EHJL. The 'being of the upper *φορά*' is of course equivalent to 'the being of the movement of the outermost sphere'—a movement which is circular,

as Aristotle had just reminded his readers (38ª 18–19). ὧδί, in the same line, I take to refer to the *special nature* of the circular path of the sun's annual movement, viz. its inclination to the equator, on which the alternation of the seasons depends. Bonitz reads κύκλῳ, ὁ ἥλιος ὧδί (sc. κύκλῳ) with F: and in ᵇ 4 he proposes ⟨οὗτος⟩ οὕτως (cf. J). Neither of these readings appears to be necessary, though both are tempting.

38ᵇ 6–19. τί . . . εἶναι. Aristotle here formulates (ᵇ 6–11) and solves (ᵇ 11–19) a subsidiary problem: cf. * 37ª 34—38ᵇ 19. Why do some γενητὰ καὶ φθαρτά form cyclical successions, whilst others *apparently* do not? Why e. g. is there obviously a cycle in which rain (ᵇ 6 ὕδατα, 'showers') produces cloud, cloud rain, and rain cloud once more (cf. * 38ª 10–17): whereas the succession of the γενέσεις of men and animals *appears* (ᵇ 11 ἔοικεν) to be rectilinear?

The solution depends on the recognition of a difference in the sense in which 'the same' member recurs. For (i) in some cycles the same individual eternally recurs: whilst (ii) in others no member recurs individually the same, but the same *species*, or *specific form*, is eternally represented in the succession of its perishing individual embodiments. Thus (i) the heavenly bodies—e. g. the sun and the planets—have a 'being' or 'substance' (ᵇ 14, 19 οὐσία) which is free from all forms of change except motion. Each of them is the unique singular representative of a species (cf. Introd. § 10) and persists as an eternally-identical individual, returning in eternally-repeated revolutions to the same point on its orbit. But (ii) the γενητὰ καὶ φθαρτά (e. g. the individual animals and men, and the individual clouds and showers of rain) have a 'being' or 'substance' which is subject to φθορά. As *individuals*, therefore, they come-to-be and pass-away once and for ever. Nevertheless rain and cloud eternally recur in a cycle: though the cloud, from which this shower falls, is only *specifically* (not *individually*) identical with the cloud to which this shower gives rise. Similarly there is a cycle in the endless rectilinear succession of the individuals of an animal species. The individual animals, indeed, like the individual clouds and showers, occur once and vanish for ever: but their 'form' or species exists eternally in the sense that it 'recurs' without interruption and without end in its individual embodiments (cf. * 36ᵇ 26–34, * ᵇ 30–32, * 37ª 1, *37ᵇ 14–25).

38ᵇ 15. ἡ . . . κινουμένῳ. For κίνησις is an adjectival and

depends—like a *πάθος*—upon the substance, or subject, of which it is predicated: cf. e. g. *Metaph.* 1070^{b} 36—1071^{a} 2.

38^{b} 18–19. εἰ . . . εἶναι. As Philoponos rightly explains, this is intended to meet a criticism which might be made by a follower of Empedokles. For Empedokles (cf. * 15^{a} 4–8) insisted that Earth, Air, Fire, and Water were eternal and indestructible. According to him, therefore, their *οὐσία* is *ἄφθαρτος*: so that, even if they recur as individually-identical members of a cycle, this does not conflict with the solution which Aristotle has just given.

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\+ = recurrit non semel in contextu

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ἄπαυστος 18^{a}25
ἀπειρία 16^{a}6
ἄπειρος 14^{a}18+; 15^{b}10+; 25^{a}15; 32^{b}14; 33^{a}7+; 37^{a}9 — opp. πεπερασμένος 18^{a}19 — opp. μέχρι του (sc. ἡ θρύψις) 16^{b}30 ἄπειρον κατ' ἐνέργειαν opp. δυνάμει ἐπὶ τὴν διαίρεσιν 18^{a}21 τὸ ἄπειρον 37^{b}28 — καὶ τὸ περιέχον 32^{a}25 τὸ ἄπειρον τοῦτο, ὃ λέγουσί τινες εἶναι τὴν ἀρχήν 29^{a}12 ἄπειροι ὕλαι 20^{b}10 — ἐναντιότητες 32^{b}14; 33^{a}7+ ἀπείροις ὠρίσθαι σχήμασι (opp. ὡρισμένοις) 25^{b}27 εἰς ἄπειρον οὐχ οἷόν τε ἰέναι 32^{b}30

εἰς ἄπειρον ἰέναι (opp. στῆναι) 32b 13; (opp. πέρας ἔχειν) 37b 25
ἀπέρχεσθαι 16b 2+; 18a 14+; 36b 9
εἰς ἀπέχοντα καὶ κεχωρισμένα (μεγέθη διαιρεῖσθαι) 16b 29
ἀπιέναι 21a 4+; 21b 13; 28b 13; 36b 4
ἁπλοῦς opp. σύνθετος 14a 28 — opp. μικτός 30b 22, cf. 34b 32 τὰ ἁπλᾶ (sc. σώματα = ἀήρ, γῆ, πῦρ, ὕδωρ) 34b 32+; 35a 9+ ἁπλῶς λέγει (ὁ Ἐμπεδοκλῆς) 33b 22 quid significet τὸ ἁπλῶς 17b 5 ἁπλῆ γένεσις, ἁπλῆ φθορά, τὰ ἁπλᾶ σώματα vide s. vv. γένεσις, φθορά, σῶμα
ἀποβολή 35b 15
ἀποδεῖξαι 33b 25
ἀποδιδόναι 18a 7; 19a 7; 26a 4; 33b 4; 36a 1
ἄποθεν 27a 4
ἀπολαύειν 21b 8
ἀπόλλυσθαι 14a 14; 19a 22 ἀπόλωλε 21a 16 ἀπολωλότα 27b 26
ἀπονέμειν τὴν αἰτίαν 36a 9
ἀπορεῖν 17b 20; 19a 22; 37a 8 τὸ νῦν ἀπορηθέν 18a 11
ἀπόρημα 27b 32
ἀπορία 16a 14; 16b 19; 21b 11; 34a 21; 34b 3 — θαυμαστή 17b 18 — ἱκανή 18a 13 ἀπορίαι πολλαὶ καὶ εὔλογοι 15b 19
ἀποφαίνεσθαι 16a 9; 25a 17
ἀπόφασις 17b 11
ἅπτεσθαι τῆς ζητήσεως 20b 34 — τοῦ καυστοῦ 22a 10 — τῆς φύσεως 24a 15 — ὅλον ὅλου 30a 2 — opp. ἄποθεν εἶναι 27a 3 — διῃρημένον opp. συνεχὲς εἶναι 25a 7 ὁπότε γὰρ ἥπτοντο (αἱ στιγμαί) 16a 30 τὸ ἅπτεσθαι = τὸ τὰ ἔσχατα ἔχειν ἅμα 23a 3 τῷ ἅπτεσθαι = κατὰ τὴν ἀφήν (ποιεῖν) 26b 23 ὁ διορισμὸς τοῦ ἅπτεσθαι 23a 22 sqq. τὸ ἁπτόμενον ἁπτομένου ἁπτόμενον 23a 25+ ἀκολουθεῖν τῷ ἁπτομένῳ 30a 1 φαμὲν τὸν λυποῦντα ἅπτεσθαι ἡμῶν 23a 33 ὅταν αὐτὰ τὰ ξύλα ἁφθῇ 22a 16
ἁπτικός 22b 27
ἁπτόν coni. γῇ 18b 31 = αἰσθητόν = οὗ ἡ αἴσθησις ἁφή 29b 8 σώματος ἁπτοῦ πάθος ἢ ἁπτόν 29b 15 ἁπτὴ ἐναντίωσις 29b 11 τὰ ἁπτά 31a 10 τῶν ἁπτῶν ποῖαι πρῶται διαφοραὶ καὶ ἐναντιώσεις 29b 17 sqq.
ἄρδειν 35a 14
ἀριθμός 36b 11; 37a 24 τὸν ἀριθμὸν ἴσαι (αἱ ἀρχαί) 35a 28 πλείω τὸν ἀριθμὸν ἑνός 29a 1 ἀριθμῷ opp. εἴδει 38b 13+ — dist. δυνάμει (sc. εἷς) 26b 6 τῷ ἀριθμῷ opp. τῷ λόγῳ (sc. εἷς) 20b 14
οἱ ἀρχαῖοι 14a 6; 25a 3
ἀρχή = principium reale 15a 19; 29a 13+; (coni. πρώτη) 29a 29; 32b 6; (τοῦ ἀπείρου) 37b 28, cf. 38a 8+ ἀρχαί 14b 16 (cf. 14a 11 et b 4); 30b 11; 35a 26; (coni. στοιχεῖα) 29a 5
ἀρχή = initium disputationis 15b 24; 22b 26; 25a 1; 26b 30; 38b 11 ἐξ ἀρχῆς 16b 18; 21a 1; 27a 32 ἐν ἀρχῇ 27a 7; 37a 25
ἡ ἀρχὴ πρώτη τῶν αἰτίων 24a 27 ἀρχαὶ καὶ αἰτίαι τῶν συμβαινόντων 26a 35 αἰσθητοῦ σώματος ἀρχαί 29b 7 (cf. b 4); (coni. εἶδη) 29b 9 ἡ ἀρχὴ τῆς κινήσεως 21b 6; 24a 27; 24b 14, cf. 34a 9 et 37a 22 αἰτία ὅθεν τὴν ἀρχὴν εἶναι φαμεν τῆς κινήσεως 18a 1 ἔστι δὲ ἡ μὲν ἰατρικὴ ὡς ἀρχή (sc. ποιοῦν) opp. τὸ σιτίον τὸ ὡς ἔσχατον 24b 3 ἡ ἀκίνητος ἀρχή 18a 5, cf. διὰ τὸ πόρρω τῆς ἀρχῆς ἀφίστασθαι 36b 31
ἀσώματος coni. ἀμεγέθης 20a 30 εἰς ἀσώματον ἐφθαρμένον τὸ σῶμα 16b 26 ἀσωμάτῳ αὐξάνεσθαι 21a 5+; 21b 16
ἀτμίς 30b 4
ἄτομα μεγέθη 16a 11; 16b 32; 17a 1 εἰς ἄτομα καὶ ἐξ ἀτόμων 17a 13
αὐλός 22a 28+ μείζους αὐλοί 22a 31
αὐξάνειν intrans. 21a 31; cf. fortasse πυρὶ γὰρ αὔξει τὸ πῦρ 33b 1 αὔξειν trans. 22a 22; (apud Empedoclem) 33b 1 αὐξάνεσθαι 15b 3+; 20a 2—22a 11; 33b 3 αὔξεσθαι 22a 24; 33b 3 τὸ αὔξον 21a 9
αὔξη καὶ φθίσις 19b 32
αὔξησις 14a 3; 15a 28+; 25b 4; 33a 35 — καὶ φθίσις 14b 15+; 27a 23 = μεταβολὴ κατὰ μέγεθος 14b 15, ἡ περὶ μέγεθος (μεταβολή) 20a 14 περὶ αὐξήσεως 20a 8—22a 33 αὔξησις dist. γένεσις 20a 10 sqq.; 22a 4–16 — dist. τροφή (= nutritio) 22a 20–28 αὔξησις τοῦ κρατοῦντος 28a 25
αὐξητικὸν σαρκός 22a 27 τὸ ἑνὸν αὐξητικόν 22a 12
ἀπὸ ταὐτομάτου καὶ ἀπὸ τύχης 33b 6
ἀφαιρετός 15a 12
ἀφανής 18b 21
ἀφανίζεσθαι 28b 13
ἀφή = contactus 22b 22+; 28b 26 — coni. διαίρεσις et στιγμή 16b 7 — ἀεὶ μία δυοῖν τινῶν 16b 6 — ἡ ἐν τοῖς φυσικοῖς 23a 34 κατὰ τὴν ἀφήν 25b 32; 26b 22 διά τε τοῦ κενοῦ καὶ διὰ τῆς ἀφῆς 25b 31 περὶ ἀφῆς 22b 29—23a 34 ἁφαί coni. στιγμαί

16^{b}4, ^{b}15 *κατὰ τὰς ἀφάς* 26^{b}12; 27^{a}12
ἀφή = *ἡ ἁπτικὴ αἴσθησις* 19^{b}19; 29^{b}8+ *κατὰ τὴν ἀφήν* 29^{b}10+
ἄφθαρτος 23^{b}23 — opp. *φθαρτή (οὐσία)* 38^{b}14
ἀφίστασθαι 36^{b}31
ἀχώριστος 20^{b}13; 29^{a}30; 32^{b}1

βαδίζειν 37^{b}7+
εἰς βάθος opp. *ἐπιπολῆς* 30^{a}18 *ἐν τῷ βάθει* 30^{a}21
βάρος opp. *κουφότης* 23^{a}8
βαρύς opp. *κοῦφος* 29^{a}12; 29^{b}19+ *τὴν γῆν βαρὺ καὶ σκληρόν (λέγει ὁ Ἐμπεδοκλῆς)* 15^{a}11 *τὸ βαρύ* coni. *γῆ* 19^{a}31 *βαρύτερον κατὰ τὴν ὑπεροχήν* 26^{a}9
βαρύτης opp. *κουφότης* 26^{a}7
βίᾳ coni. *παρὰ φύσιν*, opp. *κατὰ φύσιν (κινεῖσθαι)* 33^{b}26+
βίος 36^{b}12 *βίοι* 36^{b}11
βλέπειν ὀξύ 28^{a}14 *πρὸς ὀλίγα βλέψαντες* 16^{a}9 *εἰς ἐκεῖνο βλέψαντες* 24^{a}22
βραχίων coni. *χείρ* 21^{b}32, cf. 22^{a}19
(βρέχειν) βεβρεγμένον dist. *διερόν* 30^{a}17 def. 30^{a}22

γελοῖον 26^{b}17+
γένεσις opp. *φθίσις* 36^{b}17 — *ἡ ἐξ ἀλλήλων* 19^{a}4 — *ἡ κατὰ φύσιν* 33^{b}4 — *συγκρίσει* opp. *φθορὰ διακρίσει* 16^{b}33, cf. *αἱ γενέσεις καὶ αἱ διακρίσεις* 25^{b}30 utrum *σύγκρισις ἡ γένεσις* 15^{b}20, cf. 17^{a}31 *τὰ συνεχῶς κινούμενα κατὰ γένεσιν* 37^{a}34 *περὶ τὴν γένεσιν* opp. *ἐπὶ τοῦ εἶναι* 37^{b}12 *ἡ γένεσις εἰς τοὐναντίον* 24^{a}12 — *εἰς ἐναντία καὶ ἐξ ἐναντίων* 31^{a}14, cf. 35^{a}7
γένεσις = *ἡ ἐκ τοῦδε εἰς τόδε μεταβολή* 20^{a}13 — *οὐσίας καὶ τοῦ τοῦδε* opp. *τοῦ τοιοῦδε καὶ τοσοῦδε καὶ ποῦ* 17^{b}21 *ἡ καλουμένη ἁπλῶς γένεσις* 14^{a}7 *ἡ ἁπλῆ καὶ τελεία γένεσις* 17^{a}17 *ἡ ἁπλῆ γένεσις* opp. *ἡ κατὰ μέρος* 17^{b}35 — opp. *τὶς γένεσις* 17^{b}5; 18^{b}4 = *ἡ εἰς τὸ ἁπλῶς ὄν (ὁδός)* 18^{b}10 = *φθορά τινος* 18^{b}33 *γένεσις ἁπλῶς* opp. *γένεσις τουδί* (= *φθορὰ τουδί*) 18^{a}32, cf. ^{b}5 *ἡ θατέρου γένεσις ἄλλου φθορά* 19^{a}20, cf. 36^{b}24 *ἡ γένεσις* = *φθορὰ τοῦ μὴ ὄντος* 19^{a}28 — *τυγχάνει οὖσα ἐν τῷ περὶ τὸ μέσον τόπῳ* 35^{a}24 *ἀνάγκη γένεσιν εἶναι καὶ φθορὰν περὶ τὸ δυνατὸν εἶναι καὶ μὴ εἶναι* 35^{b}4
εἰ ἡ γένεσις ἐξ ἀνάγκης, ἀΐδιος ἡ γένεσις τούτου 38^{a}2, cf. 37^{b}34 *ἐν τῇ κύκλῳ κινήσει καὶ γενέσει ἐστὶ τὸ ἐξ ἀνάγκης ἁπλῶς* 38^{a}15 *εἰς εὐθὺ . . . ἡ γένεσις* 38^{b}11
περὶ γενέσεως τῆς τῶν στοιχείων (ἐσκέψατο Πλάτων) 15^{a}30, cf. 29^{a}13 sqq. *γένεσιν καὶ φθοράν* quomodo explicaverit *ὁ ἐν τῷ Φαίδωνι Σωκράτης* 35^{b}9 sqq.
περὶ γενέσεως καὶ φθορᾶς τῆς ἁπλῆς 15^{a}26—19^{b}5 *πῶς ἔστιν ἁπλῆ γένεσις* 17^{b}19 sqq. *τί διαφέρουσιν γένεσις καὶ ἀλλοίωσις* 19^{b}6—20^{a}7 (cf. 14^{a}5 sqq., 15^{b}6 sqq.) *γένεσις* dist. *αὔξησις* 20^{a}10 sqq.; 22^{a}4–16 *περὶ τῆς ἐξ ἀλλήλων γενέσεως τῶν ἁπλῶν σωμάτων* 31^{a}7—33^{a}15 *ἀνάγκη γένεσιν εἶναι συνεχῶς* 36^{a}16—37^{a}33
γενητός (γεννητός) 35^{a}24 *τὸ γενητὸν καὶ φθαρτόν* 27^{b}8; 35^{b}3; 37^{a}16 *τὰ γενητά* 35^{a}32; 35^{b}6
γεννᾶν 14^{a}9; 22^{b}6+; 25^{a}34; 26^{b}29; 27^{a}26; 30^{b}10; 34^{a}22; 35^{a}31—36^{b}8 *πάθος γεννᾶν* 16^{a}4 *ἐγεννήθησαν* 15^{a}18
τὸ γεννητικόν 36^{a}18
γένος 24^{b}7 *τὰ γένη* 14^{b}4 *τἀναντία ἐν τῷ αὐτῷ γένει πάντα* 24^{a}2 *τῷ γένει αἱ αὐταί (αἱ ἀρχαί)* 35^{a}29 *τῷ γένει ὅμοιον καὶ ταὐτό* opp. *τῷ εἴδει ἀνόμοιον* 23^{b}32; 24^{a}6
οἱ γεωργοί 35^{a}14
γῆ 14^{a}26+; 18^{b}4+; 19^{a}16+; 29^{a}1; 30^{b}3—32^{b}28; 34^{b}4+; 35^{a}3+ — coni. *τὸ βαρύ* 19^{a}30 — *ἀέρι ἐναντίον ἐστὶν* 31^{a}2; 35^{a}5 — *ψυχρὸν καὶ ξηρόν* 30^{b}5 — *ξηροῦ μᾶλλον ἢ ψυχροῦ* 31^{a}4 *τὸ ὂν καὶ τὸ μὴ ὂν εἶναι φάσκων (Παρμενίδης) πῦρ καὶ γῆν* 18^{b}7 *γῆ* = Empedoclis elementum 14^{a}26—15^{a}22; 33^{b}12+
γήϊνος 26^{a}31
γίνεσθαί τι opp. *γίνεσθαι ἁπλῶς* 18^{a}33+; 19^{a}3 sqq. *ἁπλῶς γίνεσθαι καὶ φθείρεσθαι* 17^{a}33; 18^{a}28+; 18^{b}13+
γλίσχρον 28^{b}4; 29^{b}20+ — opp. *κραῦρον* 29^{b}20 — def. 30^{a}5
γλυκύτης 29^{b}12
γονή 19^{b}16
γράμματα 15^{b}15
γραμμή 23^{b}26+ *γραμμαί* 20^{b}15
γωνιοειδής 19^{b}14

δέ iteratur 14^{a}12; 19^{a}11
δεικνύναι 32^{b}31 *δέδεικται* 32^{a}31; 36^{a}15+ *δεδειγμένον* 33^{a}3

δέον ὅλον τι θεωρῆσαι 23^{b}17 *ὡς τῷ λόγῳ δέον ἀκολουθεῖν* 25^{a}14
δεκτικός 20^{a}3+ *φαίνεται . . . ὡς θάτερον μὲν δεκτικὸν θάτερον δ' εἶδος* 28^{b}11
δέμας (apud Empedoclem) 33^{b}2
δέχεσθαι 26^{b}17
τὰ δημιουργοῦντα (sc. *τὸ θερμὸν καὶ τὸ ψυχρόν*) opp. *τὸ ἕν* 30^{b}13
Δημόκριτος 15^{a}35; 16^{a}1+; 23^{b}10; 26^{a}9; 27^{a}19 — coni. *Λεύκιππος* 14^{a}21; 15^{b}6+; 25^{a}1 — coni. *Ἀναξαγόρας*, *Λεύκιππος* 14^{a}18 — negat colorem 16^{a}1 eius sententia de agente et patiente 23^{b}11 sqq. Democriti et Leucippi doctrina exponitur (vel examinatur) 14^{a}21 sqq; 15^{b}6 sqq.; 25^{a}1 sqq.; 25^{b}34 sqq.
διαθιγή (vox Democriti) 15^{b}35; 27^{a}18
διαιρεῖν 16^{a}23; 16^{b}9; 18^{a}6 — *κατὰ μέρος* 16^{b}30 — *εἰς ἐπίπεδα* 16^{a}3 *διαιρεῖσθαι* 16^{a}18+; 16^{b}24+; 25^{a}7+; 27^{a}10+; 28^{a}16; 36^{a}10 — *κατὰ πᾶν σημεῖον* 16^{b}31 — *εἰς χωριστὰ καὶ ἀεὶ εἰς ἐλάττω μεγέθη* 16^{b}28 — *εἰς ἐλάττω ὑδάτια* 17^{a}28 — *εἰς μυρία μυριάκις διῃρημένα* 16^{a}22 — *εἰς μικρά* 27^{b}33 — *εἰς τὰ ἐλάχιστα* 28^{a}6 — *εἰς μηδέν* 17^{a}6 *διαιρετέον* 14^{a}2; 27^{b}32; 29^{b}17 — *τὸ ἀπόρημα* 27^{b}32 *διῃρημένα μεγέθη* 23^{a}5+
διαίρεσις 16^{a}16—17^{a}15; 27^{a}17; 28^{a}15 — coni. *ἀφή*, *στιγμή* 16^{b}7 *δυνάμει ἐπὶ τὴν διαίρεσιν* (*ἄπειρον*) 18^{a}21 *Πλάτων ἐν ταῖς διαιρέσεσιν* (cf. Timaeus 35^{a} sqq.) 30^{b}16
διαιρετός 16^{b}2; 17^{a}10+; 25^{b}32; 26^{b}4+; 27^{a}10+; 28^{a}4 *πάντῃ διαιρετόν* 16^{a}15—17^{a}3; 25^{a}8; 26^{b}26+; 27^{a}7 *διαιρετὸν καθ' ὁτιοῦν σημεῖον* 16^{b}20 — *κατὰ μέσον* 17^{a}10 *τὰ διαιρετά* 28^{b}1+
διακρίνειν 33^{b}20; 34^{a}1 — opp. *συνιστάναι* 36^{a}4 = *συγκρίνειν τὰ ὁμόφυλα* 29^{b}27 *διακρίνεσθαι* opp. *συγκρίνεσθαι* 15^{b}17; 17^{a}27; 22^{b}10; 29^{a}3 — *κατὰ τὰς ἁφάς* 27^{a}11
διάκρισις opp. *σύγκρισις* 17^{a}13; 22^{b}7; 29^{a}7; 33^{b}13 *διακρίσει* opp. *συγκρίσει* 15^{b}8; 16^{b}34; 17^{a}18+ *διακρίσει ἔοικεν* (*ἡ κατὰ φύσιν κίνησις*) 33^{b}31 *αἱ διακρίσεις* opp. *αἱ γενέσεις* 25^{b}30
διαλείπειν 37^{b}1
διάλλαξίς τε μιγέντων (cit. ex Emped.) 14^{b}8; 33^{b}14
διαλύειν 15^{b}22+ — *μέχρι ἐπιπέδων* 15^{b}32 *διαλύεσθαι* 16^{b}13; 26^{a}27 — opp. *συνιέναι* 14^{b}6 — opp. *συνίστασθαι* 25^{a}32 — opp. *συγκεῖσθαι* 25^{b}19
διάλυσις opp. *σύνθεσις* 15^{a}24 — coni. *φθορά* 25^{b}3
διαμένειν 27^{b}29
διανέμεσθαι 30^{b}6
διαπίπτειν 35^{a}3
διαπορεῖν 19^{a}9; 27^{b}27 *διηπόρηται* 17^{b}13; 21^{b}11 *τὰ διηπορημένα* 20^{b}25 *τὰ διαπορηθέντα* 27^{b}10
διάστημα 36^{b}5
διατείνειν 26^{b}35
διατελεῖν 17^{b}30
διαφανής 19^{b}23 *τὰ διαφανῆ* 24^{b}30; 26^{b}13 *μᾶλλον ἔχειν* (*πόρους*) *τὰ διαφανῆ μᾶλλον* 24^{b}32
διαφέρειν αὑτὰ πρὸς αὑτά 14^{a}23 — *ἐν τῷ πῶς* 15^{b}1 — *ταύταις ταῖς διαφοραῖς* 18^{b}17 *τὸ δὲ διαφέρει* 17^{a}23 *τὰ ἕτερα καὶ διαφέροντα* 23^{b}12 *διαφέροντα σχήματι* 25^{b}18 — *τὴν φύσιν* 26^{b}1
διαφεύγειν τὴν διαίρεσιν 16^{a}16
διαφορά 18^{b}15+; 28^{b}30 — coni. *ἐναντίωσις* 32^{a}11 *ἡ πρὸς ἄλληλα διαφορά* 20^{a}12 *τόπου διαφορὰ πρώτη* 23^{a}7 *διαφοραί* coni. *πάθη* 15^{a}8+ — *τῶν στοιχείων* (Empedoclis) 14^{b}18 *αἱ τῶν σχημάτων διαφοραί* (Democriti) 16^{a}1 *αἱ διαφοραί* 29^{b}33—31^{a}15 *πρῶται διαφοραὶ καὶ ἐναντιώσεις* 29^{b}17, cf. *αἱ πρῶται τέτταρες* (sc. *διαφοραί*) 30^{a}25
τὰ διάφορα 23^{b}7
διείργειν 25^{a}5
διεξελθεῖν 33^{a}9
τὸ διερόν def. 30^{a}16 — opp. *τὸ ξηρόν* 30^{a}13+ dist. *βεβρεγμένον* 30^{a}16–18
διιέναι κατὰ τὰς ἁφάς 26^{b}12 *διὰ τῶν πόρων διιόν* opp. *κατὰ τὴν ἁφήν* (*ποιεῖν*) 26^{b}22 (*διιστάναι*) *ἤδη ἂν διεστήκεσαν* 37^{a}12
Διογένης 22^{b}13
τὸ διορᾶν 26^{b}11
διορίζειν 14^{b}22; 15^{b}2; 18^{b}1; 23^{a}16; 24^{b}32; 25^{a}1; 27^{a}6; 27^{b}7 *διορίζεσθαι* 14^{a}6; 17^{a}30+; 17^{b}14+; 18^{b}11; 19^{a}5+; 20^{b}18; 21^{b}17; 22^{b}9+; 23^{a}3+; 24^{b}23; 27^{a}28; 29^{a}27+; 31^{a}7; 36^{a}14—37^{a}25
διορισμός 23^{a}22; 29^{a}14; 34^{b}21
διπλοῦς 37^{a}13
διττός 21^{b}20
διχῶς 20^{a}32; 24^{a}26

διώκειν τὰληθές 18b26
δνοφόεις (cit. ex Emped.) 14b22
κατὰ δόξαν opp. *κατ' ἀλήθειαν* 18b27
δρᾶν 28a35
δύετο (cit. ex Emped.) 34a5
δύναμις 18b24 — *τις ἐν ὕλῃ* 22a28 *ἑτέρα δύναμις* opp. *ἡ ὕλη* 35b31 *σώζεται ἡ δύναμις αὐτῶν* 27b31 *τὰ κατὰ δύναμιν πραττόμενα* 35b23 *τὰς δυνάμεις συμβάλλεσθαι* 33a28 *μέτρῳ τῶν δυνάμεων* 33a32 *ταῖς δυνάμεσιν ἰσάζειν* 28a29 *τὰς δυνάμεις δι' ἃς γεννῶσι (τὰ σώματα)* 36a1 *κατὰ τὰ πάθη καὶ τὰς δυνάμεις* 37a3
δύναμαι 16b12+; 17b27+; 20a15; 22a21+; 29a33; 34b14+ — dist. *ἀριθμῷ (εἷς)* 26b6 — opp. *ἐντελεχείᾳ* 16b21; 17b16+; 20a13+; 20b26; 22a6+; 26b31; 34b9 — opp. *ἐνεργείᾳ* 27b23+ — opp. *κατ' ἐνέργειαν* 18a21
δύνασθαι 18b25; 24b8; 33a24+
τὸ δυνατὸν εἶναι καὶ μὴ εἶναι 35a33; 35b4 (cf. b2) *τὰ δυνατά* opp. *τὰ ἀδύνατα (μὴ εἶναι)* 37b12
δυσόριστος 29b32

ἡ ἔγκλισις 36b4
ἐγχειρεῖν 16a4
ἐγχωρεῖν 23b12; 31b30
εἶδος 21b21+; 22a2+; 28a28; 28b11; 35a19 = *δύναμίς τις ἐν ὕλῃ* 22a28 — *τι χωριστὸν ἢ πάθος* 16b3 — (coni. *κατηγορία τις*) opp. *στέρησις* 18b17 — coni. *τόδε τι* 18b32 — coni. *σχῆμα* 21b28 — coni. *μορφή* 35a16+; 35b6 *τὰ ἐν ὕλῃ εἴδος ἔχοντα* 21b21 *κατὰ τὸ εἶδος* opp. *κατὰ τὴν ὕλην* 21b23+ *ἡ κατὰ τὸ εἶδος αἰτία* 36a2 *εἴδει* opp. *ἀριθμῷ (ὁ αὐτός)* 38b17 *τῷ εἴδει* opp. *ἀριθμῷ (ἀνακάμπτειν)* 38b13, 16 — opp. *τῷ γένει* 23b32; 24a6 *ἡ ὡς ἐν ὕλης εἴδει τιθεμένη αἰτία* 18a9
εἴδη (coni. *τέλη*) = *ἕξεις τινές* 24b17 — coni. *ἀρχαί* 29b9 *τὰ εἴδη (ἐν τῷ Φαίδωνι)* dist. *τὰ μεθεκτικὰ τῶν εἰδῶν* 35b12+ — *οἴεται (ὁ Σωκράτης) αἴτια εἶναι γενέσεως καὶ φθορᾶς* 35b15 *ἡ τῶν εἰδῶν φύσις* 35b10 *εἶναι κατὰ τὸ εἶδος* opp. *γίνεσθαι κατὰ τὴν μετάληψιν καὶ φθείρεσθαι κατὰ τὴν ἀποβολήν* 35b13
εἰκότως 19a27
εἰλικρινέστατα opp. *μεμιγμένα μᾶλλον* 30b33
εἶναι coni. *ζῆν* 18b25 *ἦν* 28b2; 31b23; 33a22; 33b23 *τὸ αὐτὸ μέν, τὸ δ' εἶναι ἄλλο* 22a26 *τὸ αὐτό, τὸ δ' εἶναι οὐ τὸ αὐτό* 19b3 *ἐπὶ τοῦ εἶναι* opp. *περὶ τὴν γένεσιν* 37b11 *τὸ εὐορίστῳ εἶναι* 28b2, cf. 33b24 *τὸ ἔσται* dist. *τὸ μέλλει* 37b4 *τὸ τί ἐστι* 21b3 *τὸ τί ἦν εἶναι* coni. *ἡ μορφή* 35b35 *τὸ ὄν* 17b6; 18b6+; 19a32; 25a3+; 36a21+ *τὸ μὴ ὄν* 17b3+; 18a14—19a32; 36a21+ *τὸ ἁπλῶς ὄν* opp. *τὸ μὴ ὂν ἁπλῶς* 18b10 *τὸ κυρίως ὄν* 25a29 *τὸ δυνάμει ὂν ἐντελεχείᾳ δὲ μὴ ὄν* 17b17, cf. b27 *τὰ ὄντα* 15b26; 18a16+; 22b27; 25a25; 26b29—28b16; 37b8 *τὰ φύσει ὄντα* 33b17 *τὰ ὅλως οὐκ ὄντα* 27b6
ὡς εἰπεῖν 15b4; 24b6 *ὡς δὲ μικρὸν παρεκβᾶσιν εἰπεῖν* 25b36 *εἴπειεν* 15b2
εἴπερ elliptice 21a17
(εἷς) τὸ ἓν 25a26; 30b13 — opp. *τὰ πολλά* 31a25 *τὸ κατ' ἀλήθειαν ἕν* opp. *τὰ ἀληθῶς πολλά* 25a35 *ἐπὶ τοῦ ἑνός* 32b14 *τὸ ἕν* (= Empedoclis *Σφαῖρος*) 15a7+, opp. *τὰ πολλά* 15a20
εἰσελθεῖν 21b8+
ὡς ἑκάστη 17a8 *καθ' ἕκαστον* opp. *καθόλου* 31a21 *τὰ καθ' ἕκαστα* 22a18; (opp. *τὰ καθόλου*) 35a27 *τί τοιοῦτον τῶν καθ' ἕκαστα λεγομένων αἴτιον* 18a8
ἐκπρισμα 16a34
ἐλαία 33b9
ἔλαιον 30a6
ἔλαττον γεγονέναι opp. *ηὐξῆσθαι* 21a3 — opp. *μεῖζον γεγονέναι* 21b14 *ἐπ' ἔλαττον τὰ ὁμολογούμενα συνορᾶν* 16a5 *ἐπ' ἐλάττω* opp. *ἐπὶ πλείω τόπον* 20a24 *τὰ ἐλάχιστα* 28a6 *αἱ ἐλάχισται (ἐναντιότητες)* 32b2
τὸ ἐλαυνόμενον 20a21
ἔλλειψις 30a7
ἐμμίγνυσθαι 15b13
Ἐμπεδοκλῆς 24b33; 25b1+; 29a3; (coni. *ἕτεροι*) 29b1; 30b20; 33a18+; 34a27 — citatur 14b7, 20; 33a19; 33b1, 14, 15; 34a3, 5 — coni. *Ἀναξαγόρας, Λεύκιππος, Δημόκριτος* 14a11 sqq. — *ἔοικεν ἐναντία λέγειν καὶ πρὸς τὰ φαινόμενα καὶ πρὸς αὑτὸν αὐτός* 15a3 — *οὐδὲν περὶ φύσεως λέγει* 33b18 *οἱ περὶ Ἐμπεδοκλέα* opp. *οἱ περὶ Ἀναξαγόραν* 14a25 sqq.

Empedocles sex ponit *στοιχεῖα*, h. e. quatuor elementa et duas motrices causas 14ª16, 17 — quatuor ponit *στοιχεῖα* 14ª26; 29ª3; 30ᵇ20 — negat generationem elementorum 15ª4, generat tamen e Sphaero 15ª7 sqq. examinatur Emp. sententia de generatione et alteratione 14ᵇ4 sqq.; de poris 24ᵇ33 sqq. (comp. cum Leucippi doctrina 25ᵇ5 sqq.); de motu 33ᵇ22 sqq. tota eius doctrina examinatur et reprehenditur 33ª16 sqq.
τὰ ἐμποδών 23ª27
ἐμποιεῖν 35ᵇ21
ἔμπροσθεν 32ᵇ31 *τὰ ἔμπροσθεν* 33ª6
τὸ ἐν ᾧ (κινεῖται) 37ª26+
ἐναντιολογία 23ᵇ17
τὰ ἐναντία 14ᵇ26; 19ª20+; 19ᵇ2; 24ª2+; 29ª31; 30ª31; 31ª2—32ᵇ21; 34ᵇ13+; 35ª8 *τῶν ἐναντίων αἴτια τἀναντία* 36ª31; 36ᵇ9 *τά τ' ἐναντία καὶ τὰ μεταξύ* 24ª8, cf. 19ᵇ12 *εἰς τοὐναντίον (ἡ γένεσις)* 24ª12+; *(μεταβάλλειν)* 32ª14 *τοὐναντίον* (e contrario) 33ᵇ30; 34ᵇ14 *ἐναντίως λέγειν* 14ª24
ἐναντιότης 32ª34—33ª6 *μετ' ἐναντιότητος* 32ª23 *ἐναντιότητες ἄπειροι* 32ᵇ14; 33ª7+
ἐναντίωσις 19ᵇ21; 20ª5; 23ᵇ9; 29ᵇ9+; 31ª15 — *αἰσθητή* 29ª10, *ἁπτή* 29ᵇ11 — coni. *διαφορά* 32ª10, cf. 29ᵇ17 *ἡ μεταβολὴ τῆς ἐναντιώσεως* 19ᵇ31 *ἐναντίωσιν ἔχειν* 28ª32; (dist. *ἐναντία εἶναι*) 23ᵇ30 *κατ' ἐναντίωσιν διαφέρειν* 29ᵇ10 *μετ' ἐναντιώσεως* 29ª26
αἱ ἐναντιώσεις opp. *τὸ δυνάμει σῶμα αἰσθητὸν* 29ª34 — *οὐ μεταβάλλουσιν* 29ᵇ2 *αἱ αἰσθηταὶ ἐναντιώσεις* 29ᵇ13 *ἐναντιώσεις κατὰ τὴν ἁφήν* enumerantur 29ᵇ18 sqq.
ἐνδελεχής 36ᵇ32 *ἐνδελεχῶς* 36ª17
τὸ οὗ ἕνεκα οὐ ποιητικόν 24ᵇ14 *ὡς δὲ τὸ οὗ ἕνεκα (αἴτιόν ἐστιν) ἡ μορφὴ καὶ τὸ εἶδος* 35ᵇ6
ἐνεργείᾳ 27ᵇ29 — opp. *δυνάμει* 27ᵇ23+ *κατ' ἐνέργειαν* opp. *δυνάμει* 18ª20
ἐνιαυτός 36ᵇ14
ἐνοικεῖν 16ª6
ἐντελέχεια 20ª15 — *μεγέθους* opp. *ἀμεγέθης ὕλη* 20ᵇ33 *ἐντελεχείᾳ* 16ᵇ24; 17ᵇ26; 20ᵇ11+; 34ᵇ13 — opp. *δυνάμει* 16ᵇ21; 17ᵇ17+; 20ª13+; 20ᵇ26; 22ª6+; 26ᵇ31; 34ᵇ9 *ὑπ' ἐντελεχείας* 20ᵇ21
ἐννυπάρχειν 16ᵇ32; 20ª34; 27ª20; 31ᵇ4+; 34ᵇ33; 35ª4+
ἕνωσις 28ᵇ22
ἐξαιρεῖν τὰ ἀλλότρια 29ᵇ28 — *τὸ τί ἦν εἶναι καὶ τὴν μορφήν* 35ᵇ35 *ἐξαιρεθείη* 35ª2
ἐξιέναι 20ᵇ12
(ἕξις) ἕξεις 24ᵇ17+ *αἱ ἕξεις* coni. *τὰ πάθη* 27ᵇ16
ἐξιστάναι ἑαυτὰ τῆς φύσεως 23ᵇ28 *ἐξεστάναι τοσοῦτον ὥστε . . .* 25ª20
ἔξω Δημοκρίτου 15ª34
ἐπαινεῖν 33ᵇ20
ἐπαμφοτερίζειν 28ᵇ9
ἐπαναποδιστέον 17ᵇ19
ἐπίδοσις opp. *μείωσις* 20ᵇ30
ἐπιεικῶς ἀναίσθητον 19ᵇ20
τὸ ἐπικρατοῦν ἐν τῇ μίξει 21ª35
ἐπιλείπειν 36ᵇ1
ἐπίπεδα (Platonis in Timaeo) 15ᵇ30+; 25ᵇ26; 29ª22+ — *ἀδιαίρετα* 25ᵇ33; 26ª22 *εἰς ἐπίπεδα διαιρεῖν* 16ª2 *μέχρι ἐπιπέδων διαλῦσαι* 15ᵇ31 — *ποιεῖσθαι τὴν ἀνάλυσιν* 29ª22
ἐπιπολῆς opp. *εἰς βάθος* 30ª17 *παρὰ τὰ ἐπιπολῆς* 15ª34
ἐπιστήμη 18ᵇ24; 27ᵇ18; 35ᵇ21+
ἐπιστήμων 18ª35; 19ª10+ *ὁ ἐπιστήμων* 35ᵇ22
τὸ ἐπιστητόν opp. *τὸ ἄγνωστον* 18ᵇ23
ἐπιτιθέναι 22ª15
ἐπιτιμᾶν 35ᵇ11
ἐπιχεῖν 22ª9
ἔργον 18ª6; 21ᵇ1 *ἑτέρας ἔργον ἐστὶ θεωρίας* 34ª15 *φήσας* (sc. *ὁ Πλάτων*) *εἶναι ὑποκείμενόν τι . . . οἷον χρυσὸν τοῖς ἔργοις τοῖς χρυσοῖς* 29ª17
τὸ ἔσχατον πρὸς τὸ κινούμενον καὶ τὴν γένεσιν opp. *τὸ πρῶτον κινοῦν* 24ª28 *τὸ ἔσχατον ἀεὶ κινεῖν κινούμενον* 24ª32 *τὸ ὡς ἔσχατον καὶ ἁπτόμενον* opp. *ὡς ἀρχή (ποιοῦν)* 24ᵇ4, cf. ᵇ27 et 24ª33 *ἐκεῖνο δὲ οὗ ταῦτα* (sc. *στιγμαὶ καὶ γραμμαί*) *ἔσχατα ἡ ὕλη* 20ᵇ16 *τὰ ἔσχατα* 23ª4+ *εἰς ἃ ἔσχατα διαλύεται* opp. *ἐξ ὧν πρώτων σύγκειται* 25ᵇ19 *τὰ ἔσχατα* (in serie elementorum) 32ᵇ12
ἐν ἑτέροις 16ᵇ18; 20ᵇ28; 29ª27; 37ª18 *τὸ παντελῶς ἕτερον καὶ τὸ μηθαμῇ ταὐτόν* 23ᵇ24 *τὰ ἕτερα καὶ διαφέροντα* 23ᵇ12
τὸ εὖ καὶ τὸ ἀγαθόν 33ᵇ19
εὐδιαίρετος 28ª24; 28ᵇ17
ἐπ' εὐθείας 32ᵇ13 *ἡ εὐθεῖα φορά* 37ª7 *εἰς εὐθύ* opp. *κύκλῳ* 38ª6+; 38ᵇ11 *εὐθύς* (sc. ut quod in promptu sit adferamus) 37ᵇ3

εὔλογον 23b19; 24a9; 35a16 μᾶλλον εὔλογον 15b32 πολὺ εὐλογώτερον 36a20 εὐλόγως 26a26; 30b6; 36b27; 38a17
εὐόριστος 28a35; 28b3+; 29b31+; 34b35 τὸ εὐορίστῳ εἶναι 28b2
εὔπορος 15b21
εὑρεῖν 21b12
εὔφθαρτος 17a27
ἐφεξῆς 17a9; 23b1 ὁρῶμεν τὸ ἐφεξῆς ὂν καὶ γινόμενον τόδε μετὰ τόδε ὥστε μὴ διαλείπειν 37a35 τὰ ἐφεξῆς (sc. τῶν ἁπλῶν σωμάτων) 31b4+
(ἐφιστάναι) περὶ τούτων ἐπιστήσασι θεωρητέον 15b18 περὶ οὐδενὸς οὐδεὶς ἐπέστησεν 15a34
ἐχομένη στιγμὴ στιγμῆς 17a3+ κατ' ἐχομένην στιγμὴν διαιρετόν 17a10 ἐχόμενον σημεῖον σημείου 17a11

ζέσις 30b27+
ζῆν 18b25
ζητεῖν 21a2; 27b7 — λόγον 18a31 τὸν τρόπον ζητοῦμεν ἀλλ' οὐ τὸ ὑποκείμενον 18b9 τὸ ζητούμενον 18b2
ζήτησις 21a1
ζῷον 22a17; 35b32 ζῷα 38b8

ἡέλιον μὲν λευκὸν ὁρᾶν κτλ. (citatur ex Emped.) 14b20
ἥλιος 15a10; 36b17; 38b3
τὸ ἠρέμα θερμόν 26a12 πάμπαν ἠρέμα opp. σφόδρα 28b7 μικτὰ ἠρέμα 28b10
ἠρεμούσης τῆς οὐσίας 14b13

θαυμάζειν 33a16
θαυμαστός 17b18
(θεῖν) συνέκυρσε θέων (cit. ex Emped.) 34a3
θεμέλιος 37b15+
ὁ θεός 36b32 τὰ στοιχεῖα διακρίνει . . . ἡ φιλία τὰ φύσει πρότερα τοῦ θεοῦ—θεοὶ δὲ καὶ ταῦτα (Emped. doctrina respicitur) 33b21
θερμαίνειν 24a9+; 27a4+ θερμαίνεσθαι 22b16; 24a17+; 24b2+
τὸ θερμαντικόν 24b8
θερμόν–ψυχρόν et ξηρόν–ὑγρόν = πρῶται ἐναντιώσεις κατὰ τὴν ἁφήν 29b18 sqq. θερμόν def. 29b26 — χωριστόν 24b19 τὸ θερμόν opp. ψυχρότης 18b16 οὔτε γὰρ τὸ θερμὸν ὕλη τῷ ψυχρῷ οὔτε τοῦτο τῷ θερμῷ 29a31 μᾶλλον καὶ ἧττον θερμὸν καὶ ψυχρόν 34b8 sqq. θερμόν–ψυχρόν enumerantur inter qualitates quibus Empedoclis elementa inter se differunt 14b18+ λέγει (Ἐμπ.) τὸν μὲν ἥλιον λευκὸν καὶ θερμόν 15a10 ἄτοπον τὸ μόνον ἀποδοῦναι τῷ περιφερεῖ σχήματι τὸ θερμόν (reprehenditur Democritus) 26a5 θερμότερον 26a10 τὸ πολὺ ὑπερβάλλον opp. τὸ ἠρέμα θερμόν 26a12 πέφυκεν, ὥς φασι, τὸ μὲν θερμὸν διακρίνειν τὸ δὲ ψυχρὸν συνιστάναι 36a3
θερμότης 26a7; 29a34; 30b26+; 32a12 οὐ γὰρ ἡ θερμότης μεταβάλλει καὶ ἡ ψυχρότης εἰς ἄλληλα 22b16
θέσις 22b33+; 23a5+ — opp. τάξις (τῶν σχημάτων, τῶν ἀδιαιρέτων σωμάτων) 14a24; 15b9 αἱ θέσεις 25b14
θεωρεῖν 32a3; 35a27; 35b20 θεωρῆσαι 25b35; 27a30; 28b31 — ὅλον τι 23b18 θεωρητέον 15b19; 17a32
θεωρία 34a15
θιγγάνειν 26a33; 26b2; 27a2
(θνήσκειν) τεθνεῶτος 21b31
θραύεσθαι 26a26
θρύψις 16b30

ἰατρική 24a35; 24b3; 28a22
ἰατρός 24a30; 35b21
ἴδιος 20b29 Δημόκριτος παρὰ τοὺς ἄλλους ἰδίως ἔλεξε μόνος 23b10
ἰέναι εἰς ἄπειρον opp. στῆναι 32b13+ εἰς ἄπειρον ἰέναι ἐπὶ τὸ κάτω 37b25
ἱκανός 18a13+; 33b22; 35a31; 35b9 διηπόρηται ἱκανῶς 21b11
ἰσάζειν 28a29; 34b23
ἴσος 16b10; 20a23; 33a32; 35a28; 36b10+ παντὶ σώματι τὸν ὄγκον ἴσον ἔσται κενόν 26b20 ταῦτα γὰρ ἴσά τε πάντα (cit. ex Emped.) 33a20 τὸ ἴσον dist. τὸ ὅμοιον 33a30
(ἱστάναι) στῆναι 32b12

(καθιστάναι) ταὐτὸν καθέστηκε 14a14
καθόλου 17b12; 23a22; 36a13 —opp. καθ' ἕκαστον 31a20 τὸ καθόλου 22a16+ — καὶ τὸ πάντα περιέχον 17b7 τὰ καθόλου opp. τὰ καθ' ἕκαστα 35a28
καίεσθαι 27b11; 31b26
(καλεῖσθαι) ἡ καλουμένη ἀπλῆ γένεσις 14a7 μεταβολὴ κατὰ μέγεθος, ἡ καλουμένη αὔξησις καὶ φθίσις 14b14 τὰ καλούμενα στοιχεῖα 22b1; 28b31; 29a16
ἐκ μὴ καλοῦ 17b5 τὰ καλά opp. τὰ

φαινόμενα διὰ συνήθειαν $25^{a}21$ · *καλῶς ἔχει λέγειν* $29^{a}6$
κάμνειν opp. *ὑγιαίνειν* $17^{a}34+$; $19^{b}13$ *τὸ κάμνον* $24^{a}18$
καπνός $31^{b}25+$
κατασκενάζειν $14^{b}1$; $25^{a}26$
κατέχειν τόπον $20^{b}1$
κατηγορία τις καὶ εἶδος opp. *στέρησις* $18^{b}16$ *τὸ πρῶτον καθ' ἑκάστην κατηγορίαν τοῦ ὄντος* $17^{b}6$ *αἱ κατηγορίαι* $17^{b}9$; $19^{a}11$
καττίτερος $28^{b}8+$
κάτω (κινεῖσθαι) $33^{b}28+$ — *ὡς ἐπὶ τῶν ἐσομένων* $38^{a}8$ *τὸ κάτω* opp. *τὸ ἄνω* $23^{a}7$ *ἐπὶ τὸ κάτω* $37^{b}25$ *τὰ κάτω τοῦ* Π opp. *τὰ ἄνωθεν* $33^{a}14$
τὰ κάτωθεν opp. *τὰ ἄνωθεν (τοῦ* Π*)* $33^{a}15$
τὸ καυστόν $22^{a}11$
κενός $21^{b}15$; $25^{a}5+$; $25^{b}9+$; $26^{b}15+$ *κενόν* coni. *σῶμα οὐκ αἰσθητόν* $20^{b}2$ — *χωριστόν* $21^{a}6$ *κενοῦ μὴ ὄντος ἐν τοῖς ἀδιαιρέτοις* $26^{a}24$ *τὸ κενόν* $20^{b}27$; $25^{a}4+$; $25^{b}3+$ — i. q. *χώρα σώματος* $26^{b}19$ *διὰ τοῦ κενοῦ* $26^{a}2$ — *καὶ διὰ τῆς ἁφῆς* $25^{b}31$
(κεραννύναι) τὸ κραθέν $28^{a}12$
κηρός $27^{b}14$; $34^{a}32$
τὸ κινεῖν καὶ κινεῖσθαι comp. *τὸ ποιεῖν καὶ πάσχειν* $24^{a}25$ sqq. *τὸ κινοῦν* $21^{b}7+$; $26^{b}3$; $37^{a}17$ — comp. *τὸ ποιοῦν* $23^{a}12$ sqq. — *διχῶς λέγεται* $24^{a}26$ — *πρῶτον καὶ αἴτιον τῆς κινήσεως* $34^{a}7$ *τὸ διὰ τὸ συνεχῶς κινεῖσθαι τἆλλα κινοῦν* $18^{a}7$ *τὸ πρῶτον κινοῦν* opp. *τὸ ἔσχατον* $24^{a}30$ — *ἀκίνητον* $24^{b}12$, cf. $37^{a}19$ *τὰ κινοῦντα (=* Empedoclis *φιλία καὶ νεῖκος)* dist. *τὰ σωματικά* (sc. *στοιχεῖα*) $14^{a}17$
τὸ κατὰ φύσιν κινεῖσθαι (opp. *βίᾳ καὶ παρὰ φύσιν*) $33^{b}30$ *κινούμεναι (στιγμαί)* $16^{b}6$ *ἡ οὐσία ἡ κινουμένη* $38^{b}14$ *τὸ κινούμενον* $23^{a}13+$; $37^{a}26+$ *τὸ κύκλῳ κινούμενον* $38^{b}1$ *τὰ συνεχῶς κινούμενα κατὰ γένεσιν ἢ ἀλλοίωσιν ἢ ὅλως μεταβολήν* $37^{a}34$
κίνησις $15^{a}28$; $23^{a}18$; $24^{a}27$—$25^{a}27$; $33^{b}22+$; $34^{a}8+$; $35^{b}17$—$37^{a}33$; $38^{b}2+$ — opp. *μονή* $33^{b}35$ *ἡ κύκλῳ κίνησις* $37^{a}24$; (coni. *γένεσις*) $38^{a}15$; (coni. *ἡ τοῦ οὐρανοῦ*) $38^{a}18$ *ἡ κατὰ φύσιν κίνησις* $33^{b}32$ *ἡ κατὰ τὴν φορὰν κίνησις* $36^{a}15$ *ἡ τῶν πόρων κίνησις* $26^{b}7$ *ἡ ἀρχὴ τῆς κινήσεως* $18^{a}2$; $21^{b}6$; $24^{a}27$; $24^{b}14$ *ἐν κινήσει ἀκίνητον* $24^{a}31$ *μεταβάλλοντα διὰ τὴν κίνησιν γίνονται γῆ καὶ πῦρ* (secundum Empedoclem) $15^{a}22$ *ἐν τοῖς περὶ κινήσεως λόγοις* $18^{a}3$ *κινήσεις* $38^{b}1$ *αἱ ἐν κύκλῳ κινήσεις* $37^{a}20$
de causa efficiente generationis et corruptionis $36^{a}15$ sqq.: vide etiam s. v. *φορά* de causa continuitatis motus $37^{a}17$ sqq. Empedoclis doctrina de motu examinatur $33^{b}22$ sqq.
κινητικός $23^{a}12+$; $35^{b}28$
κινητός $23^{a}12+$
κλίνη $35^{b}33$
κνήμη $21^{a}31$
κοινός $20^{b}23$; $21^{a}14$; $28^{a}31$; $32^{a}18$; $34^{a}24$
ὁ κόσμος $34^{a}6$
κοτύλη $33^{a}22+$
κοῦφος $29^{a}11$; $29^{b}19+$ *τὸ κοῦφον* coni. *πῦρ* $19^{a}31$
κουφότης $23^{a}9$; $26^{a}8$
κρᾶσις coni. *μίξις*, opp. *σύνθεσις* $28^{a}8$
τὸ κρατοῦν $28^{a}26+$ *κρατεῖσθαι* $31^{a}28+$
κραῦρον opp. *γλίσχρον* $29^{b}20+$ — def. $30^{a}6$
κριθὰς μεμῖχθαι πυροῖς $28^{a}2$
κρύσταλλος $25^{a}21$; $30^{b}26+$
κύκλῳ $37^{a}1+$; $38^{a}11+$; $38^{b}1+$ — opp. *εἰς εὐθύ* $38^{a}6+$ *ἡ κύκλῳ φορά* opp. *ἡ εὐθεῖα φορά* $37^{a}7$ *ἐν κύκλῳ* $37^{a}20$ *κατὰ τὸν λοξὸν κύκλον* $36^{a}32$
κυρίως $14^{a}10$; $17^{a}33$; $22^{b}23+$; $25^{a}28$ *ἡ κυριωτέρα αἰτία* $35^{b}34$ *κυριώτατον* $24^{b}27$ *μάλιστα κυρίως* $20^{a}2$
κωμῳδία $15^{b}15$

λαμβάνειν $35^{a}28$; $38^{a}8$ *ληπτέον* $20^{b}34$; $21^{b}16$
λανθάνειν $17^{a}1+$
λεαίνεσθαι $36^{a}10$
λέγεσθαι ἀμφοτέρως $17^{b}17$ — *πολλαχῶς* $22^{b}30$ — *πλεοναχῶς* $30^{a}12$ *τούτου διχῶς ἐνδεχομένου λέγειν* $20^{a}32$
λεῖον opp. *τραχύ* $29^{b}20$
λείπεσθαι $31^{b}16+$; $34^{b}6$ *τῷ λειπομένῳ τρόπῳ* $36^{b}31$
λεπτομερής $30^{a}1$
λεπτόν opp. *παχύ* $29^{b}20+$ — def. $30^{a}1$ *λεπτότερον* $32^{a}22$
Λεύκιππος $14^{a}12$; $25^{a}23$; $25^{b}6+$ — coni. *Ἐμπεδοκλῆς*, *Ἀναξαγόρας* $14^{a}12$ — coni. *Δημόκριτος* $14^{a}18+$; $15^{b}6+$; $25^{a}1$

Leucippi doctrina exponitur 25ª23 sqq.; comp. cum Emped. doctrina 25ᵇ6 sqq.; dist. a Platonis doctrina 25ᵇ25 sqq. vide etiam s. v. *Δημόκριτος*

λευκός 15ª10; 17ᵇ4; 23ᵇ27; 32ᵇ20+; 33ª29 *τὸ λευκὸν* 27ᵇ16+ — *καὶ τὸ θερμὸν = πάθη καθ' ὅσον ἀλλοιοῦται μόνον* 23ª19 *λευκόν–μέλαν* enumerantur inter qualitates quibus Empedoclis elementa inter se differunt 14ᵇ19+

λευκότης 23ᵇ25+; 29ᵇ11; 32ᵇ17

λήθη 34ª12

λίθος 34ᵇ1 *λίθοι* 34ª28

οἱ λογικῶς (opp. *φυσικῶς*) *σκοποῦντες* 16ª11

λόγος = definitio 14ª3; 17ᵇ14 *ὁ λόγος ὁ τῆς ἑκάστου οὐσίας* 35ᵇ7 *κατὰ τὸν λόγον* opp. *κατὰ τὴν ὕλην* 17ª24 *τῷ λόγῳ* opp. *τῷ ἀριθμῷ* (*εἶς*) 20ᵇ14 — opp. *τόπῳ* (*χωριστὴ ὕλη*) 20ᵇ24 — *διαφέρειν* 22ª24

λόγος = ratio mathematica 28ª9; 33ª34; 33ᵇ11+; 34ᵇ15

λόγος = argumentum, ratiocinatio 25ª13; 27ª16; 27ᵇ7 *ὁ λόγος διηπόρει* 27ᵇ27 *ὁ ἀναγκάζειν δοκῶν λόγος* 17ª1 *λόγοι ἀναγκαστικοὶ καὶ οὐκ εὔποροι διαλύειν* 15ᵇ21 *οἰκείοις καὶ φυσικοῖς λόγοις πεπεῖσθαι* 16ª13 *ἐκ τῶν πολλῶν λόγων ἀθεώρητοι τῶν ὑπαρχόντων ὄντες* 16ª8 *τῷ λόγῳ* (opp. *τῇ αἰσθήσει*) *ἀκολουθεῖν* 25ª14 *ἐπὶ τῶν λόγων* opp. *ἐπὶ τῶν πραγμάτων* 25ª18

ὁ αὐτὸς λόγος 14ᵇ25; 16ᵇ2; 24ª24; 32ª19; 32ᵇ9 *οἱ παρ' ἡμῶν λόγοι* 36ᵇ17 *Λεύκιππος ἔχειν ᾠήθη λόγους* 25ª23 *περὶ πάντων ἐνὶ λόγῳ διωρίκασι* 25ª1 *σώζειν τῷ λόγῳ* 21ª18 *ζητεῖ γάρ τινα τοῦτο λόγον* 18ª31 *ἐν τοῖς πρότερον λόγοις* 25ᵇ34 *οἱ ἐν ἀρχῇ λόγοι* 37ª25 *ἐν τοῖς περὶ κινήσεως λόγοις* 18ª4 *ὑπεναντίοι ἀλλήλοις λόγοι* 23ᵇ2 *οἰκεῖος ὁ λόγος αὐτῶν τῇ ὑποθέσει οὕτω φάναι* 14ᵇ9 *κατὰ λόγον* 24ª14; 30ᵇ2+

λοιπόν 16ª24; 16ᵇ25; 20ª8; 28ᵇ31 *τὰ λοιπὰ καὶ δύο σύμβολα* 32ᵇ29

λοξὸς κύκλος 36ª32

τῷ Λυγκεῖ δ' οὐθὲν μεμιγμένον 28ª15

λύειν 16ᵇ18 *λύεσθαι* 27ᵇ10 *λύεται τὸ εἶδος* 28ª27

ὁ λυπῶν 23ª33

λύσιν εὑρεῖν 21ᵇ12

τὰ μαθηματικά 23ª1

οἱ μαινόμενοι 25ª20

μακρῆσι κατὰ χθόνα δύετο ῥίζαις (cit. ex Emped.) 34ª5 *μακρῷ ἀληθέστατον* 29ª20

μαλακόν (opp. *σκληρόν*) 26ª13+; 29ᵇ19+ — def. 30ª8 *μαλακόν–σκληρόν* enumerantur inter qualitates quibus Empedoclis elementa inter se differunt 14ᵇ19+ *μαλακῶς* 33ᵇ25

μαλακότης 26ª8

ὁ μανθάνων 18ª34 *τὸ μανθάνον* 19ª9

μανία 25ª19+

τὸ μανὸν καὶ τὸ πυκνόν 30ᵇ11 *μανότερα* opp. *πυκνότερα γίνεσθαι* 26ª23

μάνωσις 30ᵇ10

μαρτυρεῖν 35ª9

μάταιον 26ᵇ26

μάχεσθαι 15ª16

μέγεθος 15ᵇ27+; 16ª24+; 16ᵇ1+; 20ᵇ23—21ᵇ16; 25ᵇ22; 26ᵇ17; 27ª8 — coni. *σῶμα* 16ª15+; 20ª30+ *μεγέθους ὕλη* 21ª7 *μεταβολὴ κατὰ μέγεθος* 14ᵇ14, *περὶ μέγεθος* 20ª14+ *μεγέθη ἀδιαίρετα* 15ᵇ27; (coni. *σώματα*) 16ᵇ16 — *ἄτομα* 16ª12; 16ᵇ32; 17ª1 — *διῃρημένα* 23ª5+ *ἐκ μὴ μεγεθῶν* 16ᵇ5

τὰ μεθεκτικὰ τῶν εἰδῶν 35ᵇ12+

μεθιστάναι 28ª34 *μεθίστασθαι* 30ª9

μέθοδος 27ª31

μείωσις opp. *ἐπίδοσις* 20ᵇ31

μελανία 29ᵇ12; 32ᵇ17

μέλας opp. *λευκός* 14ᵇ19+; 23ᵇ27; 32ᵇ21+

μέλλειν 32ᵇ31; 37ᵇ6+ *τὸ μέλλει* dist. *τὸ ἔσται* 37ᵇ4

μένειν 14ᵇ3; 20ª21+; 21ª25+; 32ª27; 32ᵇ20 — *ἐν τῇ αὐτοῦ χώρᾳ* 37ª11 — *ἐν χώρᾳ τεταγμένῃ* 37ª14

μέρος 14ª20; 21ª3; 21ᵇ22; 23ᵇ18; 28ª5+; 34ª31+; 34ᵇ2 *κατὰ μέρος διαιρεῖν* 16ᵇ30 *ἡ κατὰ μέρος* opp. *ἡ ἁπλῆ γένεσις* 17ᵇ35

μέσος 30ᵇ17+; 32ᵇ7+ *τὸ μέσον* = medium inter contraria 32ª35; 34ᵇ27 (cf. ᵇ28 *τὸ μέσον πολὺ καὶ οὐκ ἀδιαίρετον*) = centrum universi *τὸ πρὸς τὸ μέσον* (opp. *τὸ πρὸς τὸν ὅρον*) *φερόμενον* 30ᵇ33; *ὁ περὶ τὸ μέσον τόπος* 35ª25; cf. *ὁ τοῦ μέσου* (sc. *σώματος*) *τόπος* 34ᵇ31 *μέσον τι ἀέρος καὶ ὕδατος ἢ ἀέρος καὶ πυρός* 32ª21 (? cf. ª35) *κατὰ μέσον διαιρετόν* 17ª10, cf. 16ª20

κατὰ μεσότητα 34ᵇ29

μεταβάλλειν ἐκ τοῦδε εἰς τόδε ὅλον 17ª 21, cf. 19ᵇ 14 — *κατὰ τόπον, κατ' αὔξησιν καὶ φθίσιν, κατ' ἀλλοίωσιν* 14ᵇ 27 — *τοῖς πάθεσιν* 15ª 14, cf. 15ᵇ 18 et 19ᵇ 11 — *κατὰ τὰ πάθη καὶ τὰς δυνάμεις* 37ª 2 — *διὰ τὴν κίνησιν* 15ª 22 *τὰ μεταβάλλοντα κατὰ φύσιν* 28ᵇ 27
μετάβασις 31ª 24; 31ᵇ 13+; 32ª 2 *ἡ εἰς ἄλληλα μετάβασις* 37ª 11
μεταβλητικός 19ª 20
μεταβολή 15ª 2; 17ª 23+; 18ª 25; 18ᵇ 30; 19ᵇ 7+; 20ª 4+; 29ª 8; 31ª 11; 31ᵇ 3+; 32ᵇ 22+; 33ª 10; 36ª 19; 36ᵇ 2 — *κατὰ γένεσιν ἢ ἀλλοίωσιν ἢ ὅλως* 37ª 35 — *κατὰ μέγεθος* 14ᵇ 14 — *ἡ ἐκ τοῦδε εἰς τόδε* (opp. *ἡ περὶ μέγεθος* et *ἡ περὶ πάθος*) 20ª 12 *ἡ ἐν τῷ συνεχεῖ μεταβολή* 17ª 19 *ἡ μεταβολὴ τῆς ἐναντιώσεως* 19ᵇ 31 *ἡ μεταβολὴ εἰς τἀναντία* 32ª 7; 32ᵇ 22 *αἱ μεταβολαὶ τοῦ συγκειμένου* 15ᵇ 11
μετακινεῖν 15ᵇ 35 *μετακινεῖσθαι* 15ᵇ 13
μετάληψις opp. *ἀποβολή* (sc. *τῶν εἰδῶν*) 35ᵇ 14
τὰ μεταλλευόμενα 26ᵇ 35
μεταξύ coni. *κοινόν* 28ª 31 — opp. *τῶν ἐναντίων ἑκάτερον* 34ᵇ 13 *τὰ μεταξύ* 30ᵇ 14; 33ª 11 — opp. *τὰ ἐναντία* 24ª 8, cf. 19ᵇ 12 *τὰ μεταξὺ αὐτῶν* (sc. *τῶν Ἐμπεδοκλέους στερεῶν*) *κενά* 25ᵇ 10 *ἀέρα τιθέντες ἢ πῦρ ἤ τι μεταξὺ τούτων* 28ᵇ 35
μετασχηματίζειν 35ᵇ 26
μεταταχθέν 2[illegible]ª 19
μετατεθέν 27ª 19
κατὰ μεταφοράν 24ᵇ 15
μετρεῖν 21ᵇ 24 *μετρεῖσθαι* 33ª 21+; 36ᵇ 13
μέτρον 21ᵇ 24; 36ᵇ 15 *τῷ τοῦ ποσοῦ μέτρῳ* opp. *κατ' ἀναλογίαν* (*συμβάλλεσθαι*) 33ª 27
μέχρι ἐπιπέδων 15ᵇ 31; 29ª 22 — *του* 16ᵇ 32 — *τῶν στοιχείων* 25ᵇ 20
μῖγμα 30ᵇ 17 *τὸ σύνολον μῖγμα* 21ᵇ 2 *τὸ μῖγμα τοῦτο* (sc. Empedoclis) 34ª 28 *μίγματα* 30ᵇ 15
μιγνύναι οἶνον ὕδατι 21ª 33 (cf. 22ª 9) *μίξαντες ἄρδειν* 35ª 14 *μίγνυσθαι, μιχθῆναι* (absolute) 22ᵇ 24; 24ᵇ 34; 33ᵇ 16 *μιχθέντος τινός* dist. *καθ' αὐτὸ μεταβάλλοντος* 27ª 25 *μεμιγμένα* opp. *εἰλικρινέστατα* 30ᵇ 34 *διάλλαξίς τε μιγέντων* (cit. ex Emped.) 14ᵇ 8; 33ᵇ 14 *διὰ τὸ μιγνύμενα φθείρειν τὰς ὑπεροχὰς ἀλλήλων* 34ᵇ 11
τὰ μιγνύμενα 27ᵇ 5+ *τὰ μιχθέντα* 27ᵇ 1+; 28ª 2 *τὸ μιχθέν* 22ª 10; 28ª 10; 28ᵇ 7
εἰς μικρὰ καὶ ἐλάττω (*διάκρισις*) 17ª 16 *μικρὰ μικροῖς παρατιθέμενα* 28ª 33 *κατὰ μικρά* 28ª 7+; 34ª 29 *μικρὸν ἐκ μεγάλου* (*γίνεσθαι*) 17ª 35 *μικροῦ ἐμμιγνυμένου* 15ᵇ 13
τὸ μικρομερές 30ª 2
διὰ μικρότητα (*ἀόρατοι πόροι*) 24ᵇ 31, cf. 25ª 30
μικτός opp. *ἁπλοῦς* 30ᵇ 22 *μικτόν* = mistum 28ª 4; 34ª 14 = miscibile 27ᵇ 21; 28ª 31; 28ᵇ 1+ — def. 28ᵇ 20 *τὸ μικτόν* = miscibile 27ª 32; 27ᵇ 8; 28ᵇ 22+ *τὰ μικτὰ σώματα* = corpora mista 34ᵇ 31
μίξις 15ᵇ 4; 21ᵇ 1; 22ᵇ 8+; 27ª 30—28ᵇ 26; 33ᵇ 19; 34ᵇ 19 — coni. *κρᾶσις* 28ª 9, dist. *σύνθεσις* 28ª 6+ *μίξις τε διάλλαξίς τε μιγέντων* (cit. ex Emped.) 14ᵇ 8; 33ᵇ 14 *ἡ μίξις τῶν μικτῶν ἀλλοιωθέντων ἕνωσις* 28ᵇ 22 *περὶ μίξεως* 27ª 30 sqq.
μιμεῖσθαι 37ª 3+
μνήμη 34ª 12
μονή opp. *κίνησις* 33ᵇ 35
μονοῦσθαι 32ª 24
μόνως 20ª 11
μόριον 20ª 21; 21ᵇ 20+; 28ª 1+ *θάτερον μόριον* (*ἐναντιώσεως*) 32ª 11 *τὰ μόρια* 27ᵇ 12
μορφή coni. *πάθος* 20ᵇ 17 *ἄπειρα τὸ πλῆθος καὶ τὰς μορφάς* 14ª 23 *ἡ μορφή* coni. *τὸ εἶδος* 35ª 16+; 35ᵇ 6 — coni. *τὸ τί ἦν εἶναι* 35ᵇ 35 — opp. *ἡ ὕλη* 36ª 14 *ὡς μορφή* (sc. *ἀρχή*) opp. *ὡς ὕλη* 5ª 30 *ἐν ὕλῃ ἔχειν τὴν μορφήν* 24ᵇ 5 *περὶ τῆς ὕλης καὶ τῆς μορφῆς τῶν γενητῶν καὶ φθαρτῶν* exponitur 35ª 28 sqq.
μουσική 19ᵇ 27
μουσικός opp. *ἄμουσος* 19ᵇ 25+; 34ª 11
μυελός 14ª 20; 34ª 25
μυριάκις 16ª 22

τὸ νεῖκος (Empedoclis) 15ª 7 — opp. *ἡ φιλία* 15ª 17; 33ᵇ 12+; 34ª 1+ *ἐπὶ τοῦ νείκους νῦν* opp. *πρότερον ἐπὶ τῆς φιλίας* 34ª 6, cf. 15ª 6 sqq.
νέφος 38ᵇ 7+
νοῆσαι 21ᵇ 24
νομίζειν 18ᵇ 25

ξεῖν 36ª 10
ξηρόν 22ª 2+; 29ᵇ 19—31ᵇ 33; 32ᵇ

26; 34b29 — def. 29b31 *τὸ ξηρόν* opp. *τὸ ὑγρόν* et *τὸ διερόν* 30a13 *τὸ τελέως ξηρόν* 30a7 *τὸ πρώτως ξηρόν* 30a20 *ξηρόν–ὑγρόν* et *θερμόν–ψυχρόν* = *πρῶται ἐναντιώσεις κατὰ τὴν ἁφήν* 29b19 sqq. *ξηρόν–ὑγρόν* enumerantur inter qualitates quibus Empedoclis elementa inter se differunt 14b19

ξηρότης 32b18+

ξύλον 16b10+; 35b33 *ξύλα* 22a15+

ὄγκος 21a11; 26a31; 27b15; 28b5 *παντὶ σώματι τὸν ὄγκον ἴσον ἔσται κενόν* 26b20 *ἀδιαίρετα τοὺς ὄγκους* 27a21 *διὰ σμικρότητα τῶν ὄγκων* 25a30

ὁδός 18b3+ *ὁδῷ* 24b35

οἴεσθαι 15b9; 17a22; 18a27; 29a30; 35b9

οἰκεῖος 14b9; 29b31 — opp. *ἀλλότριος* 30a21 *τὴν οἰκείαν φωνὴν ἠγνόησεν Ἀναξαγόρας* 14a13 *ὁ οἰκεῖος τόπος* 34b34 *ἡ οἰκεία χώρα* 37a9 *οἰκείοις καὶ φυσικοῖς λόγοις πεπεῖσθαι* 16a13

οἰκία 37b15+

οἶνος 21a33—22a31; 24a30; 28a27

πρὸς ὀλίγα βλέψαντες 16a9

ὅλον μεταβάλλειν 17a22; 19b14 — *ὅλου ἅπτεσθαι* 30a2 — *ἀλλάττειν τόπον* 20a20 *ὅλον τι θεωρῆσαι* opp. *μέρος τι λέγειν* 23b17 *τὸ ὅλον* opp. *τὸ μόριον, τὰ μόρια* 20a23; 28a9 *τὸ ὅλον* (rerum universitas) 25a9+; 36b32 *ἡ τοῦ ὅλου φορά* 36b3 *ὅλως* 17b11; 19a18; 20a1; 20b30; 24a1+; 26a28; 27b6; 37a35

ὄμβρος (cit. ex Emped.) 14b21

ὁμογενής 20b19; 33a34 *τὸ ὁμογενὲς ὑπὸ τοῦ ὁμογενοῦς (πέφυκε πάσχειν)* 24a1 *τὰ ὁμογενῆ* 23a30; 29b26

ὁμοειδής dist. *ὁμογενής* 20b20

ὁμοιομερής 28a4+ *τὰ ὁμοιομερῆ* 22a19 — opp. *τὰ ἀνομοιομερῆ* 21b18+ *τὰ ὁμοιομερῆ στοιχεῖα τίθησιν (Ἀναξαγόρας)* 14a19, def. 14a20 — *ἁπλᾶ καὶ στοιχεῖα* 14a28

ὅμοιον coni. *τὸ αὐτό* 23b11+; 24a6 — opp. *τὸ αὐτό* 30b24 *τὸ ὅμοιον (τὰ ὅμοια)* 23b4+ — dist. *τὸ ἴσον* 33a30 — *ὁμοίῳ αὐξάνεται* 22a3 *προσιόντος αὐξάνονται τῷ ὁμοίῳ* 15b3 *ὁμοίως* 14a2; 18a26; 23b6; 35a26.

ὁμοιοῦν 24a10

ὁμολογεῖν 25a25 *πρὸς τὴν αἴσθησιν ὁμολογούμενα* 25a24 *ὁμολογουμένη τῇ αἰσθήσει ἡ τοῦ πυρὸς γένεσις* 31b24 *ὁμολογούμενα τοῖς παρ' ἡμῶν λόγοις* 36b16 *ὁμολογουμένως* 25b14

ὁμονοητικῶς λέγουσιν 23b3

ὁμοῦ εἶναι 27b20

ὁμόφυλος 29b30 *τὰ ὁμόφυλα* opp. *τὰ ἀλλότρια* 29b28

πρὸς ὁμώνυμον τὸ μικτόν 28b21 *ὁμωνύμως λέγεσθαι* opp. *θάτερα ἀπὸ τῶν ἑτέρων καὶ τῶν προτέρων* 22b31

ὀνειρώττειν 35b8

ὄνομα 14a6; 22b30

ἐπὶ τοῖς ὀνομάζεται (cit. ex Emped.) 33b15

ὀξὺ βλέπειν 28a15

ὀπηλικονοῦν 16b8; 26b18

ὁρᾶν 14b13; 16a10; 18a23; 24b28; 27a16; 36b17; 37a35 *ἡέλιον μὲν λευκὸν ὁρᾶν* (cit. ex Emped.) 14b21 *ὁρᾶσθαι* 24b29; 27b17; 32b1

τὰ ὄργανα 36a9+

ὀργανικός 36a2

ὀρέγεσθαι 36b28

ὁρίζεσθαι 17a18; 33a8; 33b25 *δεῖν ὁρίζεσθαι* (= definitum esse) *τὸ σύνθετον* 34b34

ὅρος 29b31+ *πρὸς τὸν ὅρον* (opp. *πρὸς τὸ μέσον*) *φέρεσθαι* 30b32; 35a20 *ἡ μορφὴ καὶ τὸ εἶδος ἁπάντων ἐν τοῖς ὅροις* 35a21

ὁστοῦν 14a19+; 21b19+; 22a19; 33b9; 34b30 *ὀστᾶ* 15a31; 34a21; 34b25

ἡ τοῦ οὐρανοῦ (κίνησις) 38a19

οὐσία = substantia 14b14; 18b35; 21a34; 38b14+ — coni. *τὸ τόδε* 17b9+ — coni. *τόδε τι* 17b32, cf. 18b15 et 19a13 *δυνάμει τις οὐσία, ἐντελεχείᾳ δὲ οὔ* 17b24, cf. 20a13 *ὡς ἐνδέχεται οὐσίαν οὐσίᾳ ἐναντίαν εἶναι* 35a6 *οὐσίας γένεσις καὶ τοῦ τοῦδε* opp. *τοῦ τοιοῦδε καὶ τοσοῦδε καὶ τοῦ* 17b21 *οὐσίας ἔσται γένεσις ἐκ μὴ οὐσίας* 17b8 *ἐν οὐσίᾳ* opp. *ἐν τῷ ποιῷ* 19a15 *αἱ οὐσίαι* 17b11+; 19a18+ *αἱ φύσει συνεστῶσαι οὐσίαι* 28b33

ἡ οὐσία ἡ ἑκάστου (= *ἡ ἑκάστου φύσις*, essentia rei) 33b14 *ὁ λόγος ὁ τῆς ἑκάστου οὐσίας* 35b7

ἐγγύτατα εἶναι τῆς οὐσίας 36b33

ὄψις (πρότερον ἁφῆς) 29b14

παθήματα 15b18; 26a21 *τὰ ἐναντία παθήματα* 31a3

παθητικός 23b5; 24b10+; 26b3; 28a

19+; 28b1+; 29b26 παθητικὰ καὶ ποιητικά 23a9; 24a7; 28a20+; 29b21+ τοῦ παθητικοῦ φλέβες 26b35
πάθος 16a4; 16b13; 19b24+; 20b23; 21a25; 23a18; 26a2; 29b15; 37a27+ — καθ' αὐτό 19b27; (opp. τὸ τί ἐστι) 21b3 — ἡ συμβεβηκὸς ὅλως 20a1 — ἐναντιώσεως 19b21 — opp. τὸ ὑποκείμενον 19b8 — coni. μορφή 20b17 — ἄνευ ὕλης 28b12 εἶδός τι χωριστὸν ἢ πάθος 16b3 πάθος δὲ καθ' ὅσον ἀλλοιοῦται μόνον 23a19, cf. 14b17 ἡ περὶ πάθος (μεταβολή) 20a14 κατὰ τὸ πάθος καὶ τὸ ποιόν (μεταβολή) 19b33
τὰ πάθη 26a19; 26b7; 34a13 — coni. διαφοραί 15a9+ — coni. αἱ ἕξεις 27b16 τὰ τῶν ἀπτῶν πάθη 31a10 τῶν παθῶν οὐθὲν χωριστόν 27b22, cf. 17b11+ et 20b25 τοῖς πάθεσι μεταβάλλειν 15a15 ἐν τοῖς πάθεσι καὶ κατὰ συμβεβηκός (μεταβολή) 17a26, cf. 19b11 κατὰ τὰ πάθη καὶ τὰς δυνάμεις (μεταβάλλειν) 37a2
πάμπαν ἠρέμα (παθητικόν) 28b6
παμπλῆρες 25a29
τὸ πανδεχές (in Platonis Timaeo) 29a14
πανσπερμία 14a29
παντελῶς 34b10
(παραλαμβάνειν) παρειλήφαμεν παρὰ τῶν πρότερον 23b1
παραλείπειν 35b34
παραλογιζόμενος (ὁ λόγος) 17a1
παραπλήσιον 25a19
παρατίθεσθαι 28a33
παρεκβῆναι 25b36
Παρμενίδης duos terminos μεταβολῆς statuit, πῦρ καὶ γῆν 18b6, cf. 30b14
παριδόντες coni. ὑπερβάντες τὴν αἴσθησιν 25a14
τὸ πᾶν (totum corpus) 16a29+; 26b9 = ὁ οὐρανός, ὁ κόσμος 14a8; 18a18; 25a7+ —(omnino) 15a19
τὸ πάσχον opp. τὸ ποιοῦν 23a18; 23b12+; 24a4+ στιγμαὶ ἢ ἀφαὶ τοδὶ παθοῦσαι 16b4 τὸ γλίσχρον ὑγρὸν πεπονθός τί ἐστιν 30a5
πατήρ 38b10
παχύ opp. λεπτόν 29b20+ τὸ παχὺ τοῦ ξηροῦ (ἐστι) 30a4 παχύτερον 32a22
(πείθειν) πεπεῖσθαι 16a13
πειρᾶσθαι 35a14 πειρατέον 15b24; 16b18
περαίνειν intrans. 25a16 πεπερασμένος opp. ἄπειρος 18a18, cf. 38a10
τὸ πέρας περαίνειν ἂν πρὸς τὸ κενόν 25a15 πέρας ἔχειν 38a5 τὰ πέρας ἔχοντα 37b30
τὸ περὶ ὅ 20a11
περίεργον 26b8+
(περιέρχεσθαι) κύκλῳ περιελληλυθέναι 37a5
τὸ περιέχον coni. τὸ ἄπειρον 32a25 τὸ καθόλου καὶ τὸ πάντα περιέχον 17b7
περίοδος 36b13+
περιπλεκόμενα γεννᾶν 25a34
περιφερής 26a4
(πηγνύναι) πεπηγός opp. ὑγρόν 27a17+ — coni. σκληρόν 27a21+ τὸ πεπηγός opp. τὸ ὑγρόν 30a14+ σκληρὸν γάρ ἐστι τὸ πεπηγός, τὸ δὲ πεπηγὸς ξηρόν 30a11 πεπηγέναι δι' ἔλλειψιν ὑγρότητος 30a7
πηλός 37b15
πῆξις 30b27+
πικρότης 29b12
πλάτος 27a8
(πλάττειν) πεπλασμένῳ τινὶ τοῦτ' ἐοικέναι 25a10
Πλάτων 15a29; 25b25+; 30b16; 32a29 — citatur 29a15 sqq. Platonis Timaeus respicitur 15b30; 25b24; 29a13; 30b16; 32a29 eius doctrina de indivisibilibus planis reprehenditur 15b30 sqq.; 29a2–24 eius doctrina dist. a doctrina Leucippi 25b25 sqq.
πλεοναχῶς 30a12
πλῆθος 25a35; 30b7 ἄπειρα τὸ πλῆθος 14a22; 25a30 τὸ πλῆθος τῶν ὄντων 25a25
πλήρης 25a11; 26b13+
πληροῦσθαι 26b8
πλησιάζειν 24b8
τὸ πλησίον (σῶμα) 37a12
πλίνθος 34b1 πλίνθοι 34a20+
πνεῦμα 21b9 — coni. ἀήρ 18b29
ποιεῖν καὶ πάσχειν ἄλληλα 23b7 ποιεῖν τι ἄλληλα 23b13, cf. 29b22 τὸ μὲν ποιεῖ τὸ δὲ πάσχει τὰς φυσικὰς ποιήσεις 15b5 μεῖζον ποιεῖν 16a31 μέγεθος ποιεῖν 16a33 πῦρ ποιῆσαι 22a14 περὶ τοῦ ποιεῖν καὶ πάσχειν 23b1 sqq. τὸ ποιεῖν καὶ πάσχειν comp. τὸ κινεῖσθαι καὶ κινεῖν 24a25 sqq. τὸ ποιεῖν καὶ πάσχειν, πῶς ἐνδέχεται συμβαίνειν 24b25—27a29 ποιεῖσθαι τὴν ἀνάλυσιν 29a22
τὸ ποιοῦν 23a15—24b16; 35b27
τὸ πρῶτον (ποιοῦν) opp. τὸ ἔσχατον

24a33 τὸ πρῶτον ποιοῦν ἀπαθές 24b13 τὸ ποιοῦν ἔσχατον καὶ κυριώτατον 24b27 τὰ ποιοῦντα 28a32 — καὶ πάσχοντα 24b33

ποίησις 22b13+; 24a32 αἱ φυσικαὶ ποιήσεις 15b6

ποιητικός 23a10—24b15; 26a2; 28a19+; 28b21; 29b21+ ἔστι δὲ τὸ ποιητικὸν αἴτιον ὡς ὅθεν ἡ ἀρχὴ τῆς κινήσεως 24b13 τῶν ποιητικῶν dist. ὅσα ἐν ὕλῃ et ὅσα μὴ ἐν ὕλῃ ἔχει τὴν μορφήν, quorum illa παθητικά, haec autem ἀπαθῆ sunt 24b4 sqq.

ποιόν dist. ποσόν, ποῦ 17b10+ dist. τί, ποσόν, ποῦ 18a15 ἐν ποιῷ opp. ἐν τῷ ποσῷ 33a29 ἐν τῷ ποιῷ opp. ἐν οὐσίᾳ 19a16 κατὰ τὸ πάθος καὶ τὸ ποιόν (μεταβολή) 19b33

πολλαχῶς λέγεσθαι 22b30

τὰ πολλά opp. τὸ ἕν 15a20 τὰ ἀληθῶς πολλά opp. τὸ κατ' ἀλήθειαν ἕν 25a36 αὐτὸ τὸ τρίγωνον πολλὰ ἔσται 16a12 οἱ πολλοί 18b19 οἱ πλεῖστοι 23b3 ἐπὶ πολὺ συνείρειν 16a7 ὡς ἐπὶ τὸ πολύ 23a25; 33b5+ ἐπὶ πλεῖον 17b14 ἐπὶ πλείω τόπον 20a24 πλεῖστον 15b28

πόροι 24b26+; 25b2+; 26b7+ διὰ τῶν πόρων διόν opp. κατὰ τὴν ἀφήν (ποιεῖν) 26b22

ποσόν 16a30 — dist. ποιόν, ποῦ 17b10+ — dist. τί, ποιόν, ποῦ 18a16, cf. 19a12 τὸ ποσόν, ποσὸν τὸ καθόλου opp. ποσόν τι, σαρξ ποσή 22a16 sqq. ἐν τῷ ποσῷ opp. ἐν ποιῷ 33a30 κατὰ τὸ ποσόν (μεταβολή) 19b31 — (συμβλητά) 33a20 sqq.

ποτέρως 20a29+

ποῦ dist. ποσόν, ποιόν 17b27 — dist. τί, ποσόν, ποιόν 18a16 — coni. τὸ τοιόνδε, τοσόνδε opp. τὸ τόδε 17b22 τὸ ποῦ dist. ποιόν, ποσόν 17b10

τὸ πρᾶγμα ᾧ συμβέβηκε opp. τὸ πάθος 37a29 τὰ πράγματα 15a33; 29a5; 36a24 — opp. αὐτοί 18b26 — opp. τὰ πάθη καὶ αἱ ἕξεις 27b17 ἐπὶ τῶν πραγμάτων opp. ἐπὶ τῶν λόγων 25a18

πραγματευτέον 17b34

πρίειν 36a10

πρίων 36a8

προϊέναι 16a14

προσάγειν opp. ἀπάγειν (τὸ γεννητικόν) 36a17

προσαγορεύεσθαι 29a20

προσγίνεσθαι 15a16; 21b26

προσεῖναι 35b7

προσέρχεσθαι 21b27+; 22a12+; 36b8

πρόσθεσις 27a24 κατὰ πρόσθεσιν 33b1

προσθεωρεῖν 36a12

προσιέναι 36b3+ προσιόντος αὐξάνονται τῷ ὁμοίῳ 15b3 προσιόντος τινὸς αὐξάνεσθαι opp. ἀπιόντος φθίνειν 21a4 (cf. a21, 27); 21b13 προσιόντος μὲν τοῦ ἡλίου γένεσίς ἐστιν, ἀπιόντος δὲ φθίσις 36b17 τὸ προσιόν 22a26

προσκόπτει γὰρ πολλοῖς 26a27

προστίθεσθαι 21a30; 33b2 μετὰ τοῦ προστιθεμένου 33a6

προσυπάρχειν 35a31

οἱ πρότεροι 35a18 οἱ πρότερον 23b2 ἐν τοῖς πρότερον λόγοις 25b34 πρότερα τὴν φύσιν 15a25 τὰ φύσει πρότερα τοῦ θεοῦ 33b21 τῇ φύσει πρότερον 29b16 de necessitatis nexu inter τὸ πρότερον et τὸ ὕστερον 37b14 sqq.; 38a12

(προτιθέναι) τὰ προτεθέντα ἐξ ἀρχῆς 27a31

προϋπάρχειν 17b17+

τὸ πρῶτον καθ' ἑκάστην κατηγορίαν τοῦ ὄντος 17b6 διαφορὰ πρώτη 23a7 πρῶται διαφοραὶ καὶ ἐναντιώσεις 29b17, cf. 30a25 ἡ ὕλη ἡ πρώτη 29a23 οἱ πρῶτοι φιλοσοφήσαντες 17b30

τὰ πρῶτα = τὰ ἴδια 35a32 (cf. a29) = ἀρχαὶ καὶ στοιχεῖα 29a5 (cf. 15b26) τὰ πρῶτα τῶν σωμάτων 25b17 = ἐξ ὧν πρώτων σύγκειται καὶ εἰς ἃ ἔσχατα διαλύεται 25b18 κατὰ τὸν ἐν τοῖς πρώτοις διορισμόν 34b21 πρῶτον = omnino 22b25 τὸ πρώτως ξηρόν 30a19 τὸ πρῶτον κινοῦν, ποιοῦν vide s.vv. κινεῖν, ποιεῖν

τὸ πυκνόν opp. τὸ μανόν 30b12 (πόροι) πυκνοὶ καὶ κατὰ στοῖχον 24b31 πυκνότερα γίνεσθαι 26a23

πυκνώσει καὶ μανώσει τἆλλα γεννῶσι 30b10

πῦρ 18b3+; 19a15+; 20b20+; 22a10+; 23b8; 24a9; 25a20; 27a4+; 27b11+; 28b35—29b27; 30b2—35a19; 36a7+; 37a5+ — coni. τὸ κοῦφον 19a31 — coni. ὕδωρ καὶ τὰ τοιαῦτα 29a35 τὸ πῦρ ἔχει ἐν ὕλῃ τὸ θερμόν 24b19 — θερμὸν καὶ ξηρόν 30b3 — θερμοῦ μᾶλλον ἢ ξηροῦ 31a5 = ὑπερβολὴ θερμότητος 30b25 sqq. — et ὕδωρ contraria sunt 31a1; 35a5

— *χεῖρον ἡ τὰ ὄργανα (κινεῖ)* 36ª12 — *μόνον ἐστὶ καὶ μάλιστα τοῦ εἴδους διὰ τὸ πεφυκέναι φέρεσθαι πρὸς τὸν ὅρον* 35ª19 *εὔλογον τὸ μόνον τῶν ἁπλῶν σωμάτων τρέφεσθαι τὸ πῦρ* 35ª17 *φαίνεται καὶ τὸ πῦρ αὐτὸ κινούμενον καὶ πάσχον* 36ª7
τὸ πῦρ = Empedoclis elementum 14ª26—15ª22; 25ᵇ23; 33ᵇ1+ *πῦρ καὶ γῆ* = Parmenidis *στοιχεῖα* 18ᵇ7; 30ᵇ14
πυραμίς 34ª33
πύρινος 26ª31
πυροειδής 30ᵇ24
πυρός 33ᵇ8+ *πυροί* 28ª3
ἐν τῷ πῶς διαφέρειν 15ᵇ1

ῥιγαλέος (cit. ex Emped.) 14ᵇ22
ῥίζαις (cit. ex Emped.) 34ª5

σάρξ 14ª19+; 21ª20—22ª28; 34ª25+; 34ᵇ5+ — *ποσή* 22ª20+ *σάρκες* 15ª31; 34ª20; 34ᵇ25
σημαίνειν 17ᵇ6; 18ᵇ1+; 19ª12+; 33ª29
σημεῖον 17ª11 — *αἰσθητόν* 21ᵇ14 *καθ' ὁτιοῦν σημεῖον* 16ᵇ11+ *κατὰ πᾶν σημεῖον* 16ᵇ31
σιτίον 24ᵇ3
σκέψις 38ᵇ12
σκληρόν 14ᵇ19+; 20ᵇ21+; 26ª3+; 29ᵇ19+ — coni. *πεπηγός* 27ª21+; 30ª11 *τὴν δὲ γῆν βαρὺ καὶ σκληρόν (λέγει Ἐμπεδοκλῆς)* 15ª11 vide etiam s. v. *μαλακόν*
σκληρότης 26ª8
σκοπεῖν φυσικῶς opp. *λογικῶς* 16ª11
διὰ σμικρότητα τῶν ὄγκων (ἀόρατα) 25ª30, cf. 24ᵇ31
σταλαγμὸς οἴνου 28ª27
(στερεῖν) τὸ ἐστερημένον ταύτης 30ª18+
στερεός 29ª22 *στερεά* 16ª3; 25ᵇ5+; 26ª22 *περὶ τῶν ἀδιαιρέτων στερεῶν* 25ᵇ35 sqq.
στέρησις 18ᵇ17 — *τὸ ἕτερον τῶν ἐναντίων* 32ª23
στιγμή 17ª3+; 20ᵇ15 — coni. *σημεῖον* 17ª12 *παρὰ τὴν ἁφὴν καὶ τὴν διαίρεσιν καὶ τὴν στιγμήν* 16ᵇ7 *ἀκίνητοι ἢ κινούμεναι αἱ στιγμαί* 16ᵇ6 *στιγμαὶ ἢ ἁφαὶ τοδὶ παθοῦσαι* 16ᵇ4 *ἐκ στιγμῶν* 16ª27+; 16ᵇ27 *ἐξ ἁφῶν ἢ στιγμῶν* 16ᵇ15; 17ª7
στοιχεῖον 15ª1+; 25ᵇ23; 29ᵇ13 *στοιχεῖα* 14ª15+; 30ᵇ8 — coni. *ἀρχαί* 29ª5 *διαφοραὶ τῶν στοιχείων* 14ᵇ18 *τὰ στοιχεῖα (= ἀήρ, γῆ, πῦρ, ὕδωρ)* 29ª15+; 29ᵇ23; 31ª14; 33ª12; 34ᵇ17+ — (i.q. *θερμόν, ψυχρόν, κτλ.*) 30ª30+; 31ᵇ27 — opp. *τὰ ἐκ τῶν στοιχείων* 22ᵇ6, cf. 34ª10 — *τῶν σωμάτων* 33ª17, cf. 34ª16 *τὰ καλούμενα στοιχεῖα* 22ᵇ2; 28ᵇ31; 29ª16+
τὰ στοιχεῖα Empedoclis 14ª16—15ª25; 25ᵇ20 (cf. 29ª3); 33ª19; 33ᵇ20 — quomodo moventur 33ᵇ22 sqq. *περὶ γενέσεως τῆς τῶν στοιχείων ἐσκέψατο Πλάτων* 15ª31, cf. 29ª13 sqq. *πῶς ἐκ τῶν στοιχείων ἔσονται σάρκες καὶ ὁστᾶ κτλ.* 34ª20 sqq.; 34ᵇ16 sqq.
στοιχειωδέστερα coni. *πρότερα τὴν φύσιν* 15ª24
κατὰ στοῖχον 24ᵇ31
στρογγύλος 19ᵇ13
τὰ συγγενῆ opp. *τὰ μὴ ὁμόφυλα* 29ᵇ30
συγκεῖσθαι 14ª22; 16ª27+; 21ᵇ18; 25ᵇ19; 34ª30; 34ᵇ32 *τὸ συγκείμενον* 15ᵇ12
σύγκρασις 36ᵇ21
συγκρίνειν 29ᵇ26+ *συγκρίνεσθαι* 15ᵇ17; 17ª27+; 22ᵇ10; 29ª3
σύγκρισις opp. *διάκρισις* 17ª13; 22ᵇ7; 29ª7; 33ᵇ12 — *ἐξ ἐλαττόνων* 17ª16 *ἡ σύγκρισις μίξις* 22ᵇ8 utrum *σύγκρισις ἡ γένεσις* 15ᵇ20sqq.; cf. 17ª31 *συγκρίσει* opp. *διακρίσει* 15ᵇ8; 16ᵇ34; 17ª18+
(συγκυρεῖν) συνέκυρσε θέων (cit. ex Emped.) 34ª3
αἱ συζεύξεις 30ª31+
αἱ συζυγίαι 32ᵇ3
(συλλαμβάνειν) συνειλημμένη τῇ ὕλῃ ἡ μορφὴ καὶ τὸ εἶδος 35ª15
τὰ συμβαίνοντα 26ᵇ1 *πάθος ἢ συμβεβηκὸς ὅλως* 20ª1 *κατὰ συμβεβηκός* 23ᵇ27 — opp. *καθ' αὑτό* 20ᵇ5+ — coni. *ἐν τοῖς πάθεσι* (sc. *μεταβολή*) 17ª26
συμβάλλεσθαι 33ª27
συμβλητός 33ª19+
σύμβολον 32ª32 *σύμβολα* 31ª24+; 31ᵇ4; 32ᵇ29
συμμένειν 35ª1
σύμμετρος 24ᵇ35
συμπληροῦν 36ᵇ31
συμφυής 27ª1
συνάγειν coni. *συγκρίνειν* 29ᵇ29 — *εἰς ἕν* 15ª6 — *εἰς τὰ δύο* 30ᵇ20
συναμφότερον 22ª21
συνδυάζεσθαι 30ª31; 32ᵇ30
συνείρειν 16ª8; 18ª13 *συνείρεσθαι* 36ᵇ33
συνελθεῖν 27ᵇ5
συνέχεια 36ᵇ3
συνέχειν 35ª2

συνεχής 26^{b}10; 36^{a}24—37^{a}32 *πόροι συνεχεῖς* 25^{b}7 *φλέβες συνεχεῖς* 27^{a}1 *τὸ συνεχὲς τούτοις ἀπόρημα* 27^{b}32 *συνεχὲς εἶναι τὸ πᾶν* opp. *ἅπτεσθαι διηρημένον* 25^{a}6 *αὐτὸ αὑτῷ ἀεὶ συνεχές* 37^{a}31 *συνεχοῦς τινος ἀριθμὸς ὁ χρόνος* 37^{a}24 *ἡ ἐν τῷ συνεχεῖ μεταβολή* 17^{a}19 *συνεχῶς* 18^{a}7; 19^{a}19; 35^{b}19; 36^{a}16; 37^{a}34; 38^{a}13
διὰ συνήθειαν 25^{a}22
σύνθεσις opp. *διάλυσις* 15^{a}23 — opp. *διαίρεσις* 17^{a}12; 27^{a}18 — dist. *μίξις* 28^{a}6+; 28^{b}19 — *σωζομένων* 34^{b}6
σύνθετος opp. *ἁπλοῦς* 14^{a}29 *τὸ σύνθετον* opp. *τὰ ἁπλᾶ* 34^{b}35 *ἐν ἅπαντι τῷ συνθέτῳ πάντα τὰ ἁπλᾶ ἐνέσται* 35^{a}9
συνιδεῖν 14^{b}13
συνιέναι 15^{a}23; 27^{b}28 — opp. *διαλύεσθαι* 14^{b}5
συνιστάναι opp. *διακρίνειν* 36^{a}4 *συνέστηκεν* 31^{a}3; 34^{a}16; 35^{a}22 *αἱ φύσει συνεστῶσαι οὐσίαι* 28^{b}33 *συνίστασθαι* opp. *διαλύεσθαι* 25^{a}32
σύνολος 21^{b}2
συνομολογεῖσθαι 29^{a}6
συνορᾶν 16^{a}5
συντιθέναι 16^{b}9 *συντίθεσθαι* 16^{a}3+; 25^{a}34; 28^{a}25; 33^{b}9
συντόμως 17^{b}14
συνώνυμος 14^{a}20
συστοιχία 19^{a}15
σύστοιχος 15^{a}21
σφαῖρα 20^{a}22; 34^{a}33
σφάλλεσθαι 17^{a}20
σφόδρα opp. *πάμπαν ἠρέμα* (*παθητικόν*) 28^{b}6
σχῆμα 26^{a}15; 27^{b}14 *τὸ σχῆμα* coni. *τὸ εἶδος* 21^{b}27 *σχήματι διαφέροντα μόνον* (*τὰ πρῶτα τῶν σωμάτων*) 25^{b}18 *τὰ σχήματα* (= Democriti et Leucippi *στερεὰ ἀδιαίρετα*) 15^{b}7+; 26^{b}1; cf. 26^{a}4+ *ὡρίσθαι σχήμασι* 25^{b}27+
σχηματίζειν 27^{b}15
σχιζομένων τῶν σωμάτων 27^{a}15
σώζειν 21^{b}12 — *τῷ λόγῳ τὰ ὑπάρχοντα* 21^{a}17, cf. ^{a}29 *σώζεσθαι* 21^{a}21; 22^{a}24; 27^{b}17+ *κατὰ μικρὰ σωζόμενα* (*τὰ μιγνύμενα*) 28^{a}7, cf. 34^{a}29 et 34^{b}6
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